Railway Age

Vol. 83 August 27, 1927 No. 9

A Train Load of Case Threshing Machines on the C. & N. W. Near Racine, Wis.

Contents

The Importance of Accelerating Freight Train Movement....Page 367

B. H. Mann, consulting signal engineer, Missouri Pacific, in address before Superintendents' Association, says progress being made in train loading but not all roads increasing speed of trains.

Piers Show No Depreciation After 85 Years' Service..... 373

E. M. Hastings, chief engineer of the Richmond, Fredericksburg & Potomac, tells of Rappahannock river structure retired because of double tracking.

Erie Uses Bill Posting Methods in Material Campaign..... 375

Company assumes that it "pays to advertise" in conserving material as well as in field of transportation merchandising.

EDITORIALS:

When to Worry About Motor Truck Competition 363
British Interest in American Safety Campaigns..... 363
Graduated Pay for Section Men 363
Holding Up Railway Bus Operation..... 363
The I. C. C. Train Control Questionnaire 364
The Unification of Terminals 364
Too Little Coal Being Bought 365
It's the Elimination of Delays That Counts 365
A Lesson in Business for Labor 365

GENERAL ARTICLES:

The Importance of Accelerating Freight Train Movement, by B. H. Mann 367
Freight Car Loading 370
Dining Cars for the D. & R. G. W..... 371
Piers Show No Depreciation After 85 Years' Service, by E. M. Hastings 373
W. H. Gatchell Addresses Carmen 374

GENERAL ARTICLES—Continued

Erie Uses Bill Posting Methods in Material Campaign..... 375
P. & L. E. Trains Call for Route by Microphone, by I. S. Raymer 377
New Tractor Completes Series 378
Baltimore & Ohio's Changed Position 379
Small Increase in Ties Treated During 1926..... 382
A Diagnosis of Rail Failures, by T. H. Symington..... 383
Accident Investigations in the Month of April..... 386
Forsyth Friction Draft Gear 387
C. M. & St. P. Electric Operation Extended to Seattle..... 388

LOOKING BACKWARD..... 388
COMMUNICATIONS AND BOOKS..... 389
ODDS AND ENDS OF RAILROADING..... 391
NEWS OF THE WEEK..... 392

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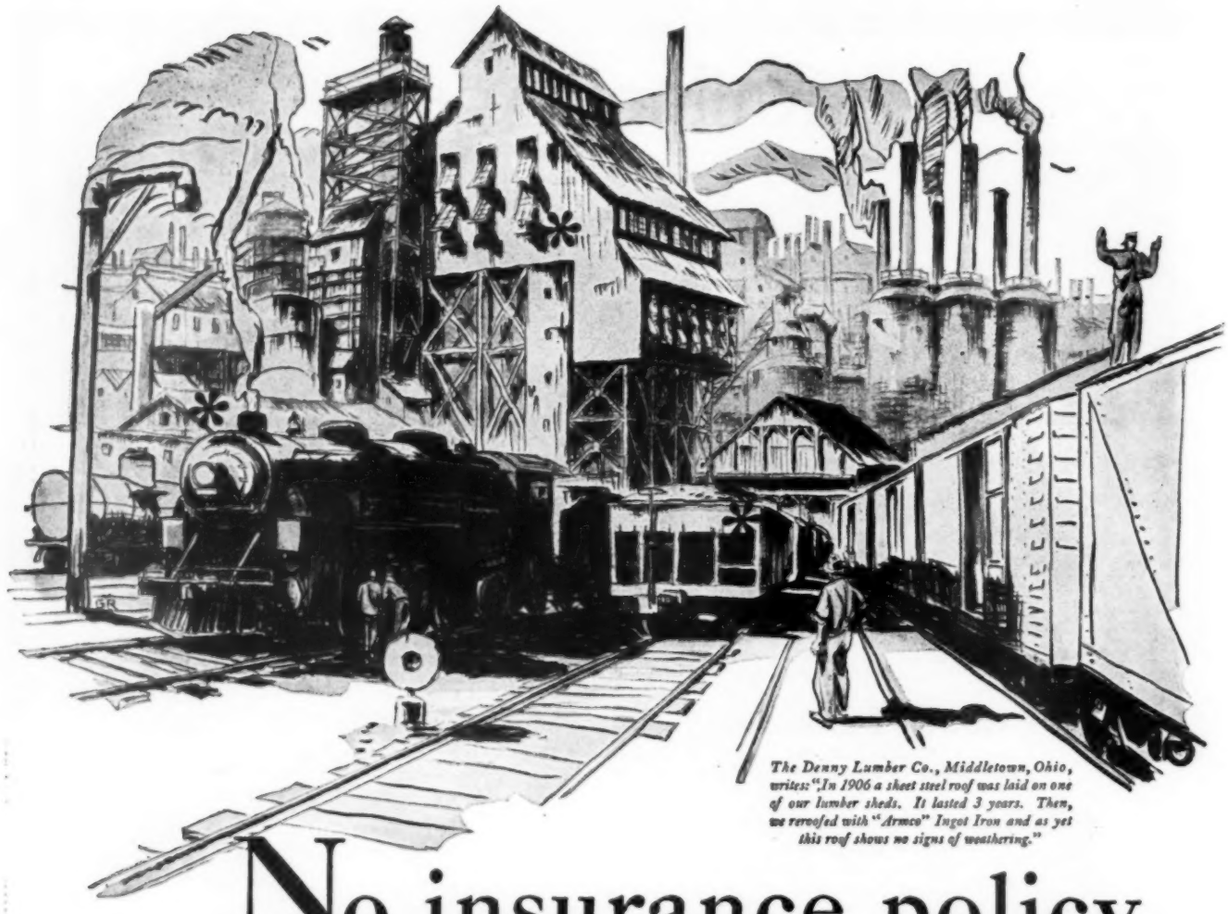

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Railway Age

Vol. 83, No. 9 August 27, 1927 Table of Contents Appears on Page 5 of Advertising Section

When to Worry About Motor Truck Competition

JUST at what length of haul the railroad should begin to worry about motor truck competition is a question which, apparently, must be settled variously for different locations. Recent figures which we have seen for l.c.l. traffic between two points in the neighborhood of 100 miles apart are interesting—not to say startling. Terminal costs, at both ends, exceed the line costs by 500 per cent and total out-of-pocket costs exceed total revenue by 20 per cent. The case cited is quite likely exceptional but, plainly, in this particular instance it would seem that the loss of all the business would be a benefit to the railroad. But would it? Is there not some danger in educating shippers to a too great reliance on motor trucks which operate entirely independently of the railroads and, again, cannot something be done to lower the excessive terminal costs which make the operation unprofitable? The growing co-ordination of highway transportation with rail will tend to insure the utilization of the more economical agency. Moreover, the rail handling of l.c.l. shipments, with particular reference to terminal costs, is undergoing constant study and there is reason to believe that a solution, if one exists, may in no great time be found. To consider but one activity in this field, it is probable that the possibilities of the container car have by no means been exhausted.

British Interest in American Safety Campaigns

THE Railway Gazette (London), in introducing a series of articles on accident prevention, makes reference to the accomplishments of the American roads in this regard. It adds, however, that there is a question whether, even with our improvement, the position of the railroad employee in America is as safe as that of his British colleague. The Gazette recognizes the fact that the making of accurate comparisons in this field between the two countries is impossible, because of varying methods of compiling statistics. Moreover, because of widely varying conditions, we doubt that such comparisons even if they could be made would be highly profitable. The important comparison is between the statistics of one's own country for the past year, set alongside similar totals for preceding years—Is the annual total declining or rising? As American railroad men know, the total railroad casualties in this country have been declining, and the railroads because of their safety campaigns no doubt deserve credit for the improvement. Railroads the world over can learn much by studying each other's problems and methods. Just as numbers of American railroad men have in the past few years been interested in the collection and delivery methods of the British railways, which have no counterpart in this country, so apparently in the matter of safety campaigns the American roads have some information which might prove of value to the British railways. Indeed the first article in the Railway Gazette's series is largely based on the records of individual American roads. It is gratifying to see the spread of a movement which has important economic effects and is at the same time so humanitarian.

Graduated Pay for Sectionmen

A GRADUATED scale of pay for section laborers, based on length of service, has been given official recognition by the board of arbitration which considered the demands of the maintenance of way employees on the Chicago & North Western for increased pay. Under the decision handed down the pay of section laborers with less than one year's service was reduced one cent an hour from the former rate, with annual increases of two cents an hour for each additional year of service for the next two years. Leaving aside the question as to the justice of actual rates of pay specified in this particular decision, or the ability of the railway to pay them, it is encouraging to note that the principle of the graduated scale has been sanctioned officially. Men in charge of track maintenance have long recognized the fact that experienced men are worth more than those who must be trained in the rudiments of the work and also that with the flat rate for all laborers in a gang there was little incentive for men to continue in the work. Under the new system it should be possible to build up gangs of experienced men, with the result that maintenance costs will be reduced by the increased efficiency of the men.

Holding Up Railway Bus Operation

IN spite of the rapidity with which the motor bus is being adopted by the railways, it would have been even more rapid but for the obstructions interposed by some state regulatory commissions in their refusal to grant, or their delay in granting, bus line certificates to railway applicants. Certain cases are well known, among these being the year-and-a-half effort of the Reading, still unsuccessful, to establish a large system of supplementary bus lines; that of the Baltimore & Ohio to begin supplementary bus operation in West Virginia, projected nearly a year ago; and the months-old application of the Chicago & Alton for certificates to cover a large supplementary bus line system in Illinois. In fairness, it must be granted that the problem of the commissions in these states and in others has

been complicated by many factors—the apparently conflicting requirements of fairness to the railways and to the independent bus and electric lines, political pressure, and what not. On the other hand, commissions in other states have found no difficulty in acting upon railway applications without delay and this action usually has been favorable. These delays have been discouraging to the railways involved and to other railways which have wished to adopt the motor bus. Since it is generally agreed that the railways are the logical operators of motor buses in co-ordination with their train service, and that such co-ordination is in the public interest, the difficulties encountered by them in their efforts to secure bus line certificates have been contrary not only to their interests but to the interests of the public as well.

The I. C. C. Train Control Questionnaire

THE questionnaire issued by the Interstate Commerce Commission on August 1, requiring approximately 168 roads to furnish certain information about train control, signals and highway crossing protection has now been in the hands of the carriers long enough for certain questions to have arisen as to the interpretation of some of the inquiries. Numerous conjectures have also been advanced as to the use the commission will make of the information to be assembled and whether or not this action will lead to another general train control order.

Although this questionnaire was sent with an order dated July 22, and formed a part of the much discussed order No. 13413—In the Matter of Automatic Train Control Devices—the questionnaire included numerous inquiries aside from those concerning train control, i. e., miles of road equipped with automatic block signals, cost of installation and maintenance of such systems, number of failures, etc., together with considerable general information as to the methods used for controlling the movements of trains on other than automatic territory. The class and volume of traffic and an accurate account of accidents for the last six years are to be explained in full and a statement included showing the number of highway crossings eliminated in the same period.

This inquiry is evidently an effort on the part of the commission to assemble information that will place it in a position to direct the carriers to install such safety devices as it considers may be justified by the class and volume of traffic handled. Each carrier now has an opportunity to present facts regarding the efficiency of its own methods of operation, its signaling, etc. In other words, it has a chance to show whether it believes that additional expenditures should be made for train control, automatic signals, highway crossing protection, or for other safety devices. A point to be considered in answering this questionnaire is that all available data should be included and that nothing should be left out with the idea that such information is recorded in other presentations or reports; for the commission proceeds on the evidence of the case in hand. Therefore, details as to the causes of train accidents are especially desirable.

The railroads now have an opportunity to present their own individual ideas as to what additional safety equipment is required. There seems to be no reason to believe that the commission is preparing to issue another extensive order for the installation of automatic train control. Rather, it would appear that each individual carrier is to be dealt with separately in the future on the basis of the information presented now and the efficiency of its present operating methods.

The Unification of Terminals

THE unification of terminals has long been advocated by city planning enthusiasts and by not a few railway men as the ideal arrangement for a community. It is contended that such a plan permits economy of operation, facilitates the movement of freight into and out of the industries and improves service generally by eliminating duplication of effort. When the roads were taken over by the government and brought under unified control during the war many attempts were made to consolidate the terminals at the larger cities and some slight progress was made in this direction. In general, however, it was found that the industries and railways alike had been so built in relation to each other that little can now be gained at this late date by rearranging and unifying the terminals and that in many cases the results of such action would be detrimental to service rather than otherwise.

In a discussion of this subject the fact is often lost sight of that there is one large city in this country in which the terminals have been completely unified and in which they are operated under common control, namely, St. Louis—East St. Louis. Here all of the roads entering the terminal participate in the ownership and control of the Terminal Railroad Association of St. Louis, which latter organization provides common facilities for both passenger and freight service at cost for all lines. Because of this arrangement one may reasonably look here for the results of unification.

An examination of the facilities provided and of the service rendered here shows that the industries are being served and the traffic moved with an efficiency that compares favorably with the performance at other terminals of equal size. Likewise, the Interstate Commerce Commission has pronounced the rates charged for the service to be fair and equitable on more than one occasion. Yet the terminal has long been the target for agitation and the public, through the city authorities, has been active in fostering a duplicate facility.

As a step in this direction the City of St. Louis built a bridge across the Mississippi river a few years ago at a heavy expenditure, one deck of which was to be given over to railway tracks. Yet although an effort was made to devise a plan whereby the Terminal Railroad would use the railway deck of the bridge, nothing has come of this plan and in lieu thereof a connection has been effected with the Alton & Southern, a short industrial railway on the east side of the river, while bonds have been voted by the people recently to build an approach on the west bank to provide a connection with the Manufacturers Railway, a short industrial line owned by the Anheuser Busch interests. With the completion of this approach, the City of St. Louis will have in return for its large expenditure a duplicate connection between the east and west sides of the river providing service only between relatively few industries and even in that respect duplicating the service that the existing unified terminal railroad is prepared to offer. Advocates of unified terminals can well afford to consider the situation at St. Louis to determine in what fundamental respects, if any, it differs from conditions that would exist in any other city of similar size in which the terminals should be unified.

Too Little Coal Is Being Purchased

THE strike in the union bituminous coal mines may have serious consequences after all, and if it does it will be due to the failure of consumers to buy during the summer months as much coal as mines that are open can produce. On April 1, when the strike began, there were 75,000,000 tons of bituminous coal in storage, the largest amount ever reported. Up to July 1, on which date the next report was made, the supply stored had declined 13,000,000 tons, but was still the largest ever reported for that date. Since then production and storage supplies have further declined entirely because of a reduction in the demand of consumers. Between April 1 and July 1 the average number of cars loaded weekly at the mines was 156,438, while during the next six weeks ending August 6 the average was only 146,373.

During the first three months of the year production was 21,000,000 tons greater than in the first quarter of 1926, but since then this excess has been wiped out and the total production thus far this year is now slightly less than during the corresponding part of last year. The storage supplies are still comparatively large, but the facts show that with fall approaching they are declining one to two million tons a week. How long will the strike last? This is becoming a question of serious importance. If consumers continue to deplete their stocks by buying less than can easily be produced they may enter the fall months with no more than normal supplies. At that time consumption of coal will begin largely to increase, and it is by no means impossible it may then be found, if the strike continues, that the mines open cannot produce enough to meet the increased demands of fall and winter. The average weekly consumption throughout the year is about ten and one-half million tons, and, of course, it is substantially larger in the late fall, early winter and spring. Current production is running at the rate of only about 8,250,000 tons a week.

It seems plain that if the strike lasts some months longer, the consumers of coal, unless they speedily increase their purchases, are likely to create mining and transportation conditions which will be disagreeable for them.

It's the Elimination of Delays That Counts

A FEW weeks ago, the president of a large railway said: "Not many years ago we used all our engineering ingenuity in finding locations where sidings could be built at least cost. Now we use rock drills and explosives, if necessary, to put sidings where they really belong." There is a great deal in what he says. Its importance is brought out in a paper read by B. H. Mann, consulting signal engineer, Missouri Pacific, before the American Association of Railroad Superintendents and appearing in this issue. Mr. Mann cites his experience with a subdivision of his railroad to show what can be done by physical improvement in the way of eliminating road delays.

The sacrifice of tonnage for speed is in general, a futile gesture and, even where it is not necessary to reduce the tonnage to obtain greater speed, there is a certain maximum speed for each district beyond which it is not economical or efficient to go. There is also a maximum figure beyond which the tonnage should not be raised, using existing power and equipment.

Recently developments in operating efficiency have proved that these limits are not nearly as confining as they were once believed to be, but still the limits are there and are perilously close to being reached on some railways. It is in such cases that a study of the physical characteristics of the division and changes in its physical characteristics, based on operating needs rather than economy, will pay dividends.

Before these maximum figures of tonnage and speed are reached, attention should be given to the possibility of increasing the transportation output of the division by the more efficient location of sidings, additional signal equipment and the relocation of existing signals and other operating measures tending to increase the freight train speed by reducing delays on the road. When the average train speed is increased in this manner, the faster times does not have the effect of requiring a reduction in tonnage, which frequently results when an attempt is made to increase the average train speed merely by running the trains at higher speed while they are in motion.

Relocating the facilities on a division is likely to be expensive, it is true, particularly in hilly or mountainous country, but attempting to operate trains over a busy division with insufficient or poorly located facilities is more expensive. Moreover, the latter expense is a continuing one, and constitutes a steady drain on resources that is unwarranted.

A Lesson in Business for Labor

UNDER the leadership of the late Warren S. Stone, the Brotherhood of Locomotive Engineers a few years ago engaged in two movements which while widely different, apparently were inspired by reasoning from similar premises. It gave its support to the Plumb plan of government ownership and employee management of the railroads. It also acquired the ownership and management of banks, coal mines and Florida property. Under the Plumb plan the public would have furnished the capital to buy the railroads, while for the acquisition of banks, coal mines and Florida land capital was furnished by members of the brotherhood. In the two cases, however, similar assumptions were made as to the qualifications needed to invest capital and manage business successfully. It is significant that the business world rejected the Plumb plan and at the same time welcomed the entrance of working men into business with their own capital. It is also significant that, by the frank admission of the present leaders of the brotherhood, the conduct of its enterprises by their predecessors was not successful, and it is now being turned over to men of business experience.

The "radical" movement throughout the world aims not so much at overthrowing existing governments as at overthrowing "capitalism." It is predicated upon such assumptions as that profits earned upon invested capital are obtained by underpaying labor; that the management of a concern so that it will show a profit results from this exploitation of labor rather than from the exercise of superior foresight, judgment and energy by its owners and managers; that representatives of labor democratically elected could and would manage industry and commerce successfully if given control of capital; and that the result would be to add to the incomes of the working people the profits now received

and enjoyed by the capitalists. The owner of capital is regarded as performing no functions except those of receiving and spending an assured income from his investments. The present managers of business are regarded as performing no functions requiring exceptional knowledge, effort and ability and, therefore, justifying large salaries.

Functions of Capitalist and Manager

Perhaps the most important mistake made by those who think thus is regarding the function of the capitalist. The rarest form of business ability is the ability to make good investments. Comparatively few persons have the will and foresight to save part of their incomes. Still fewer can so invest their savings as to get a return of even as much as 6 per cent. The number who have enough knowledge, judgment and courage to so invest their own savings and what they can borrow as to make large profits is an extremely small fraction of those who have something to invest; but these are the men to whom economic progress is mainly due. Here and there men get rich owing to good luck, but in a great majority of cases large profits, and in consequence large fortunes, are made by investing in enterprises that furnish the public something new that it needs or wants or by effecting relatively great reductions in the operating costs of existing concerns in proportion to their earnings.

Under modern conditions the day-to-day and year-to-year administration of many large industrial, commercial and financial concerns is delegated to officials who own little or no interest in them. Directly or indirectly, however, they are selected by those in financial control, and almost invariably because they have had experience and training and shown ability indicating superior capacity as administrators. One need not leave the railroad industry to find recent examples of large profits for stockholders that have resulted almost entirely from improvements in the physical condition and operation of properties that have been made by managers who themselves are not large stockholders, but who have spent their lives in acquiring a high proficiency in railroad management.

False Assumptions About Business

It is inevitable that those who have not themselves engaged in business or devoted study and observation to ascertaining what is required to manage a business successfully, will not know what is required to produce profits. They do not know how large a part of all business concerns fail because of unwise investments and inefficient operation, although as much is to be learned from their experience as from that of concerns that succeed. The tacit assumption of the advocates of the Plumb plan was that, even if committees of railway employees were allowed to fix their own wages, the railways inevitably would earn enough net return to pay the interest on the public's investment in them—a remarkable assumption in view of the fact that at the very time the Plumb plan movement was begun the railways, under government operation, were failing to earn interest on the investment in them. There is implicit in the entire "radical" movement the assumption that democratically selected representatives of the employees—in other words, men with experience in labor politics rather than business—could and would so manage the railroads and other industries that capital would be wisely invested and operation would be efficient and economical, while at the same time the income of everybody employed would be raised—excepting, of course, the "high salaried" officials.

Those who led the Brotherhood of Locomotive Engineers into its various business enterprises proceeded upon such assumptions. Soon, however, Mr. Stone was in a public row with the president of the mine workers union because, as Mr. Stone declared, he could not afford to pay union wages in the brotherhood's coal mines. The significant discovery had been made that wages must be paid out of the earnings of the mines, and therefore could not be made higher than the earnings justified. Here and elsewhere officers and members of the brotherhood found, by actual experience, that whether profits or losses are made depends upon whether capital is invested with good judgment and managed with ability. It is easy to so manage any business as to lose money. It is difficult to so manage any business as to make it pay.

It is the margin between operating expenses, interest and taxes, on the one side, and total earnings, on the other, that constitutes profits. Even in a successful business this margin is narrow, and a small decline in efficiency of management will result in an increase of operating expenses that will wipe it out. The test of the manager is whether he can pay the same unit costs as managers of other concerns in the same line of business, and keep this narrow margin of profit somewhat wider than his rivals do.

Attitude of Labor

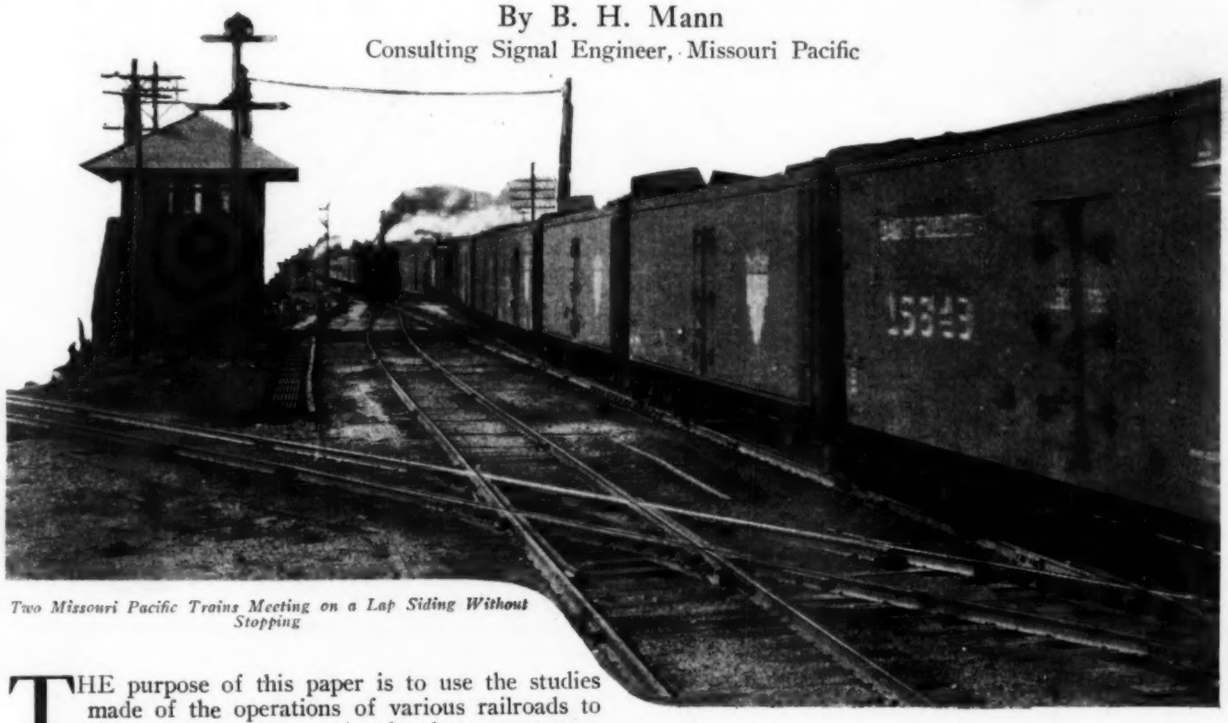
It is to be hoped the Brotherhood of Locomotive Engineers will succeed in saving its investments and making them pay. At the same time it is also to be hoped that railway employees and labor generally will learn something more about business from the experience of the locomotive engineers than they can learn from the silly misrepresentations of business published in most of the papers of their labor unions. American labor generally is not radical in the sense that it wants to destroy private property and set up a bolshevik state. Many leaders of American organized labor do, however, show radical tendencies by occasionally supporting some such scheme as the Plumb plan; by exaggerating the returns earned upon capital to create prejudice against capitalists; by attacking the so-called "fancy salaries" of railway officers as excessive in proportion to the efforts made and the service rendered by those who get them; and by supporting schemes for unduly limiting railway and other profits upon the false assumption that this will tend to increase the wages of labor. Most of the laboring class needs to learn that large profits are usually the result of good management; that without them there would be no incentive to good management; that the large salaries paid to a comparatively few men are necessary to get men of ability to manage large properties; that these things are the price that must be paid for good business management, whoever owns the business; and that in the long run probably three-fourths of the benefits of good business management go, not to the owners and managers of capital, but to those that it employs.

Every young man in this country always has had and has now opportunity to get a large income by becoming an owner, investor and manager of capital. Reason and experience afford abundant ground for the belief that curtailment of this opportunity will not only curtail business profits, but have the much more important effect of arresting increases in the incomes of that large majority of the people who, through lack of ability, foresight or will power, never become owners of capital, but become year by year the recipients of constantly increasing incomes because of the way capital is invested and operation is conducted in successful concerns.

The Importance of Accelerating Freight Train Movement

*Comparisons show that while progress in increasing train load is good, not all railroads are improving train speed**

By B. H. Mann
Consulting Signal Engineer, Missouri Pacific



Two Missouri Pacific Trains Meeting on a Lap Siding Without Stopping

THE purpose of this paper is to use the studies made of the operations of various railroads to show that, on the one hand, where a management contemplates an increase in the size of the power or other means to produce more gross ton-miles per train hour through an increase in train load, it is also desirable to accompany such a plan by roadway improvements based on a scientific study of acceleration of the train. If this is not done, the increase in gross ton-miles per train hour which should result from the increased train load may be, in part, nullified by a decrease which is brought about by a slowing down in the train movement. On the other hand, even though an increase in draw bar pull is not contemplated, a material increase in gross ton-miles per train hour may come both from acceleration and through a greater train load by a scientific plan of improvement of the single track.

Freight train economies through acceleration of trains are a matter of factory production by the superintendent. The superintendent manufactures gross ton-miles and sells revenue ton-miles.

An increase in gross ton-miles per train tour is produced in two ways: (1) by greater train load and (2) by acceleration of movement of the train. The appended freight train performance diagrams show that as far as the increase in the train load is concerned, the progress is good, but where acceleration of freight train speeds is concerned, there are great differences in the performances of the railroads. The diagrams show that whereas some railroads are increasing their factory output by raising the train loads and by accelerating the speed of trains, other roads, although increasing train loads satisfactorily, have not kept pace with their acceleration.

The diagrams show also that there is a limit, a critical point, on a freight train subdivision, both for train load and number of trains, at which limit the everage gross ton-miles per train hour seem to be relatively fixed. Further increase in train load does not result in any increase in the gross ton-miles per train hour. The diagrams also indicate that on a single track freight train subdivision, when the movement exceeds a certain number of trains, the curve showing the output flattens out so that, unlike other lines of business, in railroading more production does not always mean more profits per unit or train.

An Efficient Subdivision

The 56-mile single track subdivision of the Missouri Pacific between Kansas City, Mo., and Osawatomie, Kan., with a rolling gradient, the maximum being 1.2 per cent, supplies an excellent illustration. A 22.6 per cent increase in the average speed of freight trains, a 20 per cent increase in ton-miles per train hour and a reduction of over 850 tons in coal consumption per month were accomplished on this subdivision during 1926. The average speed over the 112 miles, including stops, has been increased from 9.81 miles an hour to 12.03 miles an hour. This includes 3 hr. 30 min. average detention for the turn-around at Kansas City. These

*From an address delivered before the American Association of Railroad Superintendents, San Francisco, Cal., June 21-24.

results have been accomplished by relocating passing tracks and adding lap sidings at other points in addition to the installation of a controlled manual block signal system by which trains are operated by signal indication without written train orders. In compliance with the orders of the Interstate Commerce Commission and to

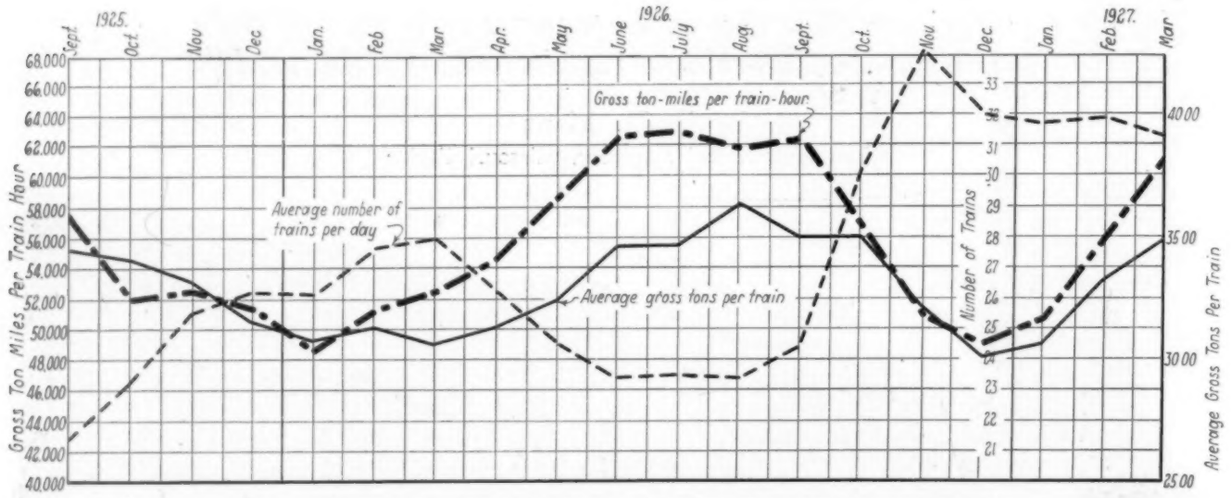


Fig. 1—Diagram Showing the Influence of the Number of Trains on Output

ber of trains on the output. This diagram represents one freight train sub-division's performance for a number of months. The peak load months for gross ton-miles per train hour are May, July and August. In the months of October, November and December the train load was reduced, due to the increase in the number of trains necessary to handle the business. The chart shows also that notwithstanding the variation in train loads, the gross ton-miles per train hour may be practically the same; therefore, increasing the train load does not always increase the factory output. On this particular subdivision, when the average gross tons per train pass 3,500, the limit is reached. This shows that the subdivision is in need of facilities to accelerate its trains and that also through this, the train load may be increased and the output increased in both ways.

serve as an additional safety factor, train control of the intermittent inductive type of the National Safety Appliance Company was also installed. These changes were carried out in accordance with a plan developed in an extensive study of traffic. A full description of the methods used in bringing this stretch of track to its present efficient operation will be found in the *Railway Age* of December 19, 1925.

In 1924, the gross ton-miles per train hour for this subdivision averaged 18,500. The output in the peak

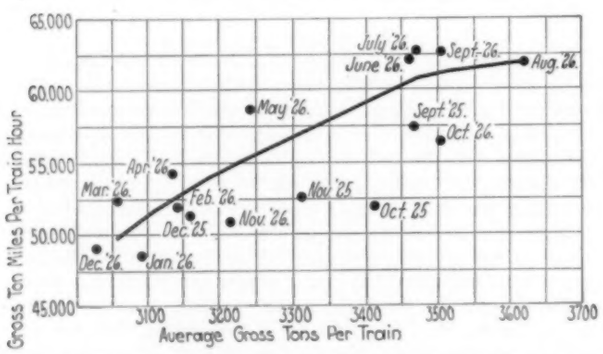


Fig. 2—The Influence of Train Load on Gross Ton-Miles Per Train Hour

load month in 1925 represented an increase of 20.9 per cent over the output under the ordinary train order system as operated in 1924 and was brought about through the installation of single track improvements outlined above.

An increase by the same amount from 1925 to 1926, due solely to the co-operation and loyalty of the men, raised the total increase over the 1924 output to 42 per cent. Thus, it will be seen that the percentage of increase due to the handling of the facilities by the men was approximately as great as that brought about by putting in the facilities themselves.

Figure 1 shows the value of the influence of the number of trains on the output. This diagram represents one freight train sub-division's performance for a number of months. The peak load months for gross ton-miles per train hour are May, July and August. In the months of October, November and December the train load was reduced, due to the increase in the number of

The curve in Fig. 2 represents on the horizontal co-ordinate, the train load, and on the vertical co-ordinate, the gross ton-miles per train hour. This curve shows that with a train load ranging from 3,050 tons to nearly 3,200 tons the rate of increase in the gross ton-miles per train hour is about the same. For train loads in excess of 3,200 tons the rate of increase is less and decreases still further for train loads of over 3,500 tons. Due to the fact that the train load and the number of

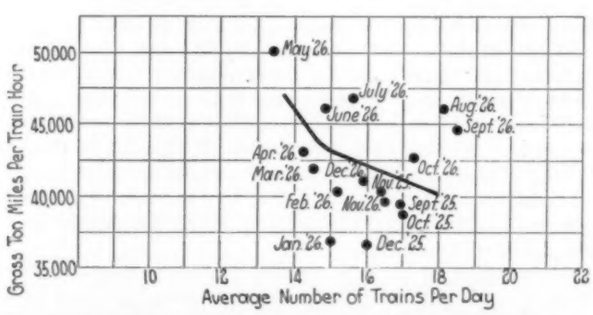


Fig. 3—The Influence of the Average Number of Trains on Gross Ton-Miles Per Train Hour

trains depend upon each other and one influences the other through acceleration, the rate of increase changes. For train loads above 3,500 tons the curve of gross ton-miles per train hour flattens out so that in the peak load period it made very little difference on this particular subdivision what increase in train load the sup-

erintendent effected, the gross ton-miles per train hour remained the same.

Figure 3, depicting the operation of another sub-division, similarly represents the influences of the number of trains. There is a critical point, on a single-track subdivision operating a certain number of trains, represented here by approximately 14.5, where a reduction in the number of trains increases the gross ton-miles per train hour much more rapidly. Where this condition exists, it shows that there is necessity for some improvement of that single track subdivision to permit the superintendent to keep up the normal rate of increase of gross ton-miles per train hour, even though his number of trains per day amounts to as many or more than 15.

Performance on Various Railroads

As an indication of the relative increases that have occurred in train load and train acceleration, charts have been made covering the performance of 15 railroads in various parts of the country, showing the relative curves of gross ton-miles per train hour, gross tons per train

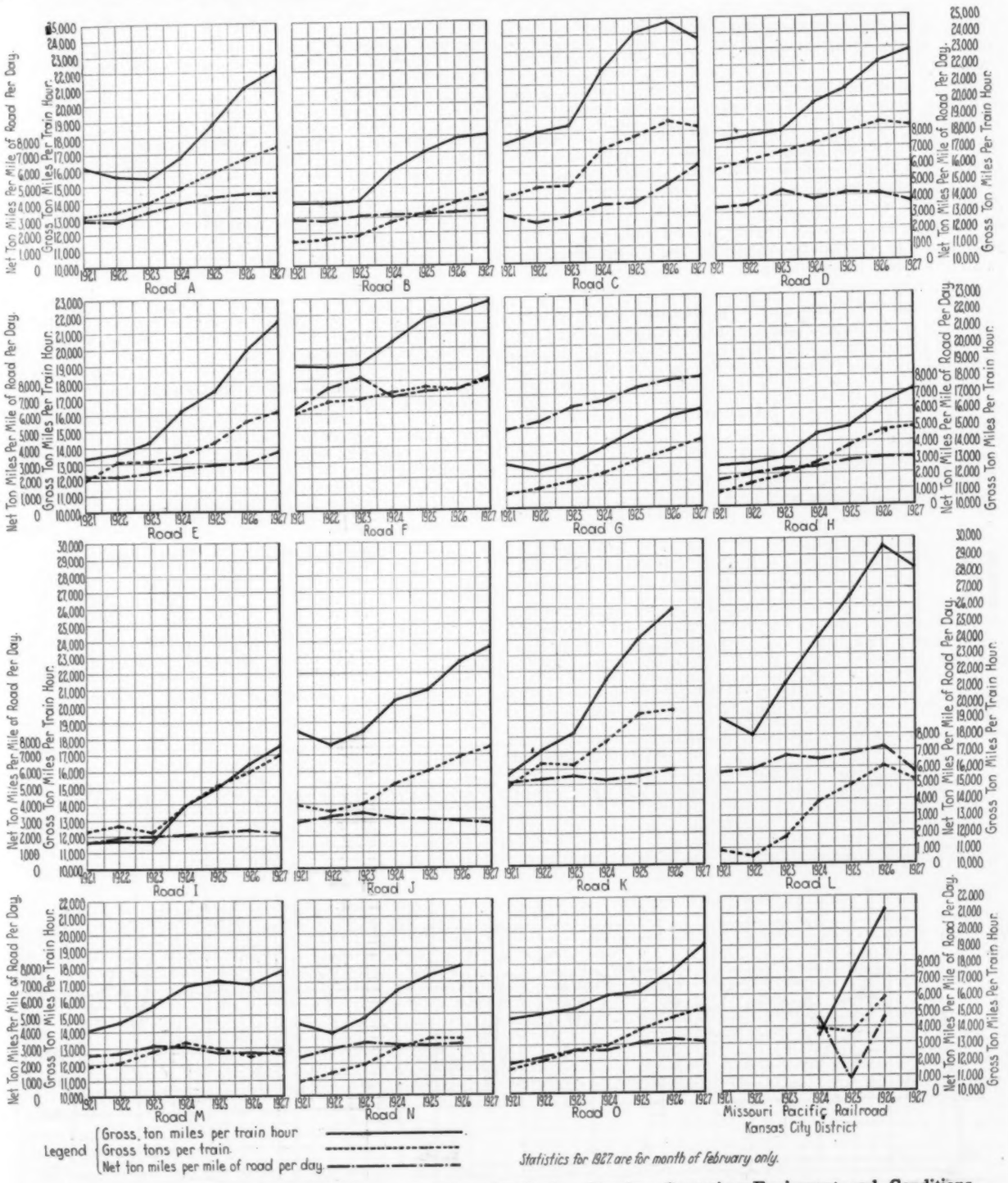


Fig. 4—Comparison of Operating Results on 16 Railroads Having Varying Operating Equipment and Conditions

and net ton-miles per mile of road per day. A resume of these diagrams, as shown in Fig. 4, is interesting and informative.

Percentage figures of increase of 1926 over 1921 are not shown for comparative purposes between these different railroads or between these roads and the Kansas City district of the Missouri Pacific as such comparisons under the varying circumstances that existed during these years would be of relatively little value. However, the very satisfactory improvement in the gross ton-miles per train hour on the Kansas City district can be noted from the extreme steepness of the curve on its chart. The acceleration of trains on this district made possible an increase in the train load so that both factors making up the gross ton-miles per train hour were benefited.

The good results in volume production of gross ton-miles per train hour by a scientific improvement of the Kansas City district have been confirmed by operations on a second freight train subdivision where certain territories were improved by continuous double track, certain other stretches by a scientific rearrangement of the single track and certain other sections were given no additions to increase the capacity. The percentage improvement in operations based on the investment was relatively quite favorable in the stretches on which the scientific improvement of single track had been made.

The actual practical value of a scientific study of any one main track to accelerate train movements where an increase in capacity is contemplated has now been demonstrated by an experience of two years' development on at least two independent single track freight subdivisions and this question, therefore, no longer is an unproved theory.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended August 13 amounted to 1,049,280 cars, a decrease of 53,380 cars as compared with the corresponding week of last year and also a decrease of 15,196 cars as compared with 1925. This brought the cumulative total for the year to date slightly below that for the corresponding period of 1926. The Pocahontas district was the only one to show an increase as compared with last year and l.c.l. merchandise was the only commodity classification to show an increase. Coal loading showed a reduction of 21,574 cars, while ore loading also showed a reduction of 19,804 cars. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

WEEK ENDED SATURDAY, AUGUST 13, 1927.

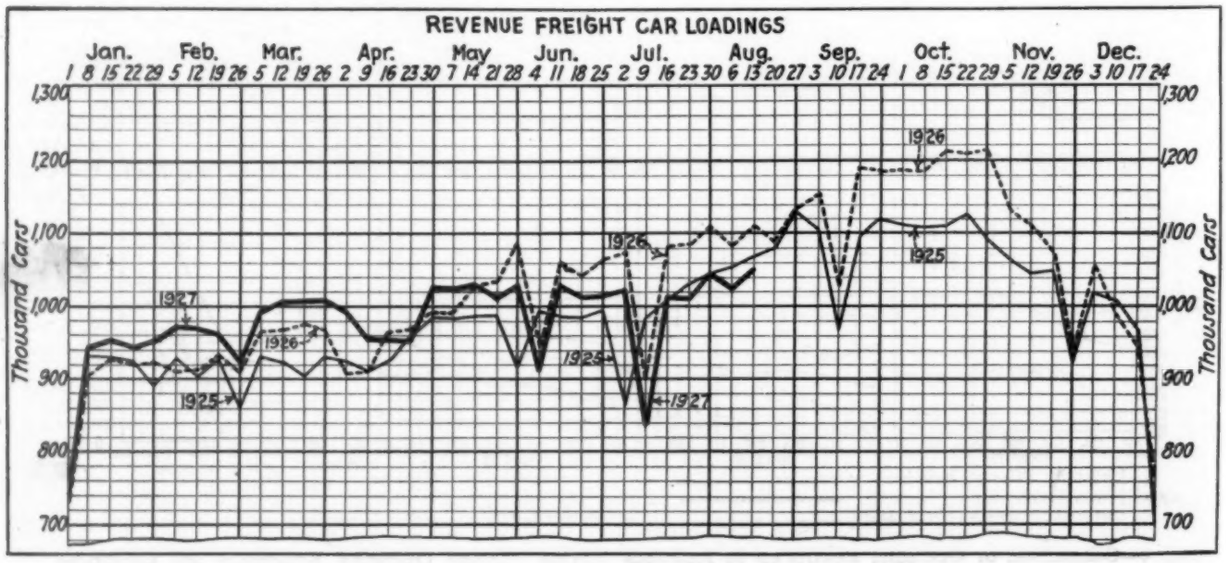
Districts	1927	1926	1925
Eastern	240,359	250,829	248,738
Allegheny	210,891	223,600	212,145
Pocahontas	62,950	61,617	57,656
Southern	149,475	150,845	148,692
Northwestern	159,714	173,788	165,788
Central Western	150,499	161,224	151,718
Southwestern	75,392	80,757	79,739
Total West. Districts	385,605	415,769	397,245
Total all roads	1,049,280	1,102,660	1,064,476
Commodities			
Grain and grain products	53,489	57,169	54,593
Live stock	27,402	30,479	30,854
Coal	171,294	192,868	191,479
Coke	9,748	11,296	9,742
Forest products	68,345	72,039	70,894
Ore	59,497	79,301	64,750
Mdse. L. C. L.	259,357	257,849	258,992
Miscellaneous	400,148	401,659	383,172
August 13	1,049,280	1,102,660	1,064,476
August 6	1,024,218	1,075,392	1,052,518
July 30	1,045,621	1,095,997	1,045,626
July 23	1,012,424	1,078,193	1,033,519
July 16	1,016,782	1,076,372	1,012,854
Cumulative total, 33 wks.	32,335,621	32,400,962	31,390,575

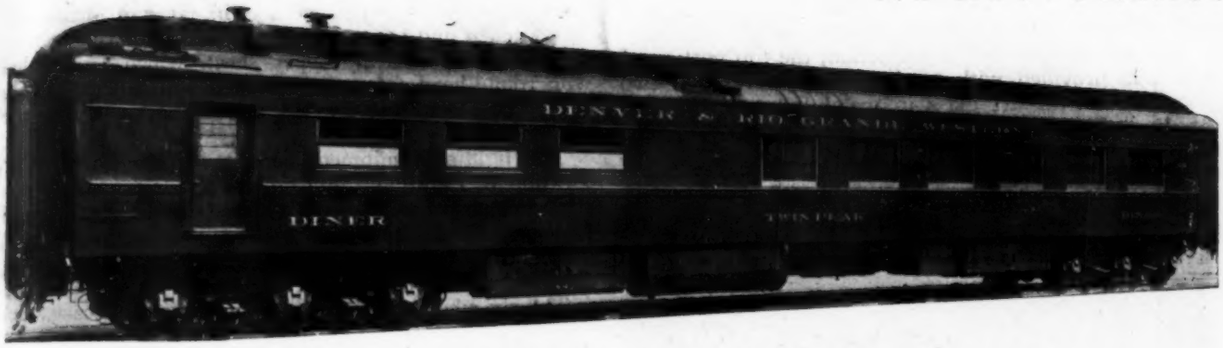
The freight car surplus for the first week of August averaged 254,324 cars, while for the period ended August 15 the average was 245,291 cars, including 66,130 coal cars, 140,289 box cars, 19,343 stock cars and 13,036 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended August 13 totaled 63,343 cars, an increase over the previous week of 3,232 cars and an increase of 4,975 cars.

Commodities	Total for Canada			Cumulative Totals to Date	
	Aug. 13, 1927	Aug. 6, 1927	Aug. 14, 1926	1927	1926
Grain & Grain Products	3,788	3,535	3,450	216,794	207,402
Live Stock	2,347	2,152	2,066	62,650	63,990
Coal	7,448	7,386	6,899	206,549	163,914
Coke	263	268	228	9,948	11,806
Lumber	4,424	4,491	3,770	119,966	116,836
Pulpwood	2,027	2,119	2,025	113,414	93,508
Pulp and Paper	2,272	2,232	2,193	71,629	78,847
Other Forest Products	2,716	2,728	2,419	98,552	102,245
Ore	2,050	1,544	2,132	50,424	52,379
Merchandise, L. C. L.	18,261	17,196	17,350	541,582	512,568
Miscellaneous	17,747	16,460	15,836	451,031	437,085
Total Cars Loaded	63,343	60,111	58,368	1,942,539	1,840,580
Total Cars Rec'd from Connections	36,287	34,404	36,050	1,212,933	1,189,309





One of Four Dining Cars Built for the Denver & Rio Grande Western by the American Car & Foundry Company

Dining Cars for the D. & R. G. W.

Seating capacity for 36 persons—Built with blind ends and with end doors, with side doors in the kitchen and passageway

FOUR dining cars of all-steel construction were recently delivered to the Denver & Rio Grande Western by the American Car & Foundry Company. These cars have a length over the buffers of 82 ft. ⅞ in. and an overall height of 14 ft. 3 in. The dining room has a total inside length of 39 ft. 5½ in., with a seating capacity for 36 persons. Both the inside and outside of the cars are finished with Duco, the interiors of two of the cars being finished in a blue combination and the other being finished in brown. The general dimensions of the cars are as follows:

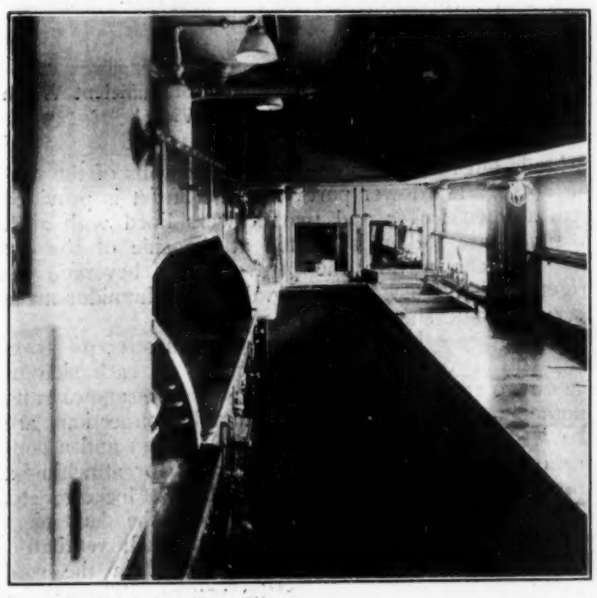
Length over end posts	78 ft. 10 in.
Length over buffers, coupled	82 ft. ⅞ in.
Length between end posts	78 ft. ¾ in.
Width over side sills	9 ft. 10½ in.
Width overall at lower deck eaves	10 ft. 2⅛ in.
Height from rail to top of roof at center	14 ft. 3 in.
Height from rail to side of eave molding	11 ft. 3 in.
Height from rail to bottom of side sill at end	3 ft. 8¼ in.
Truck wheel base	11 ft.

The Dining Room

The dining rooms in all four cars have a flat beamed ceiling on which are located five ceiling fans. Each table is centered on a window which is of sufficient width to permit an unobstructed view without the guest seated at the table having to lean forward in order to look out. Each of the side windows is provided with inside and outside sash, fitted with 3/16-in. polished plate glass. The two cars finished in blue have the lower walls from the floor to the top of the deck sill molding finished in lagoon blue with aluminum striping. The upper walls above the top of the deck sill molding and including the lower and upper deck ceiling panels and fans are finished in Guernsey cream with gold striping. The chairs and tables are done in Saratoga blue.

The lower walls from the floor to the top of the deck sill molding of the two cars finished in Beige combination are Heathcote brown with maroon striping. The upper walls above the deck sill molding and the upper deck ceiling panels and fans are finished with Belere cream with gold striping. The chairs and tables have a mahogany finish.

The six large and six small dining tables are made of birch with a wood bead around the top. The chairs are covered in genuine leather of Spanish finish, to suit the interior of the car. The floors are covered with Wilton carpet of a color combination to harmonize with the general interior scheme. All trimmings are of bronze.



Interior of the Kitchen Looking Toward the Pantry

The Kitchen and Buffet

The kitchens and pantries in all the cars are similar in finish and general arrangement. The entire kitchen is finished in dull gray Duco, with the exception of the galvanized iron front of the counter. The outside wall of the pantry is finished in the same color as the dining room, while the remainder is finished the same as the kitchen. Lockers are provided in the kitchen for the

cook's clothes. The sink is of Monel metal and is built with sides 4 in. high around the dish chute.

The buffet is of steel construction, the top portion of which is provided with two wooden shelves and two doors with clear art glass in metal frames. Curtains of sheer silk are hung on the inside of the doors. The

Each Table Is Centered on a Window of Sufficient Width to Provide Unobstructed View

inside is finished the same color as the walls of the dining room. The lower portion of the buffet is provided with a linen locker and two drawers lined with zinc. A silverware locker is located at the side of the car near the entrance to the pantry. The beverage refrigerator is fitted with a removable cigar humidor made of zinc, single sheet.

The cars are heated with the vapor system of steam heat with two control valves located on each side of the dining room; one of these is for the passageway and another for the pantry coil. Suitable connections are provided for the steam table in the kitchen and a connection is also provided in the kitchen for attaching a hose for cleaning out sinks, ice boxes, lockers, etc. There are 26 honeycomb ventilators in the deck piers with a flush register on the inside of each ventilator. Four double-trap ventilators are located in the roof of the kitchen and three in the pantry. Three 6-in. Globe ventilators are located in the passageway. Exhaust fans are provided in the kitchen and pantry.

As shown in one of the illustrations, the cars have underframes with double girder fish-belly type center sills. The bolsters are of the Commonwealth cast steel combined double body bolster and platform design. The lower floor over the entire underframe is of 1/16 in. steel, except galvanized steel is used at the steam traps. Wooden floor supports are applied on top of this steel floor. On these supports, except under the kitchen and pantry, is applied a 5/8-in. galvanized steel floor, the under side of which is coated with Milar-Clinch car cement and on this is applied a 5/8 in. layer of Mastacote. The kitchen and pantry floors are laid with yellow pine flooring covered with copper sheet, which is studded with round-head screws and flooded with solder. Ozite carpet cushioning is applied under the carpet in the dining room.

The lighting equipment consists of the Safety Car Heating & Lighting Company's 4 kw. slow speed underframe suspension system and a set of Edison storage batteries of 450 amp. hr. capacity. The regulator and switchboard lockers are located in the passageway at the kitchen end of the car.

The six-wheel trucks are of Commonwealth cast steel

Interior of One of the Dining Rooms

straight equalizer and inside side bearing type. They have 5-in. by 9-in. journals, with pedestals and equalizer spring caps cast integral, and have Simplex clasp brakes.

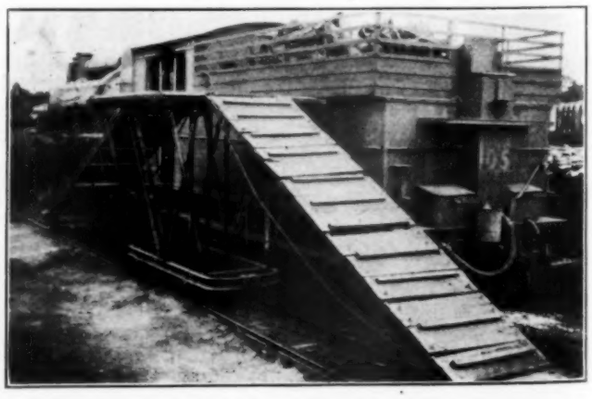
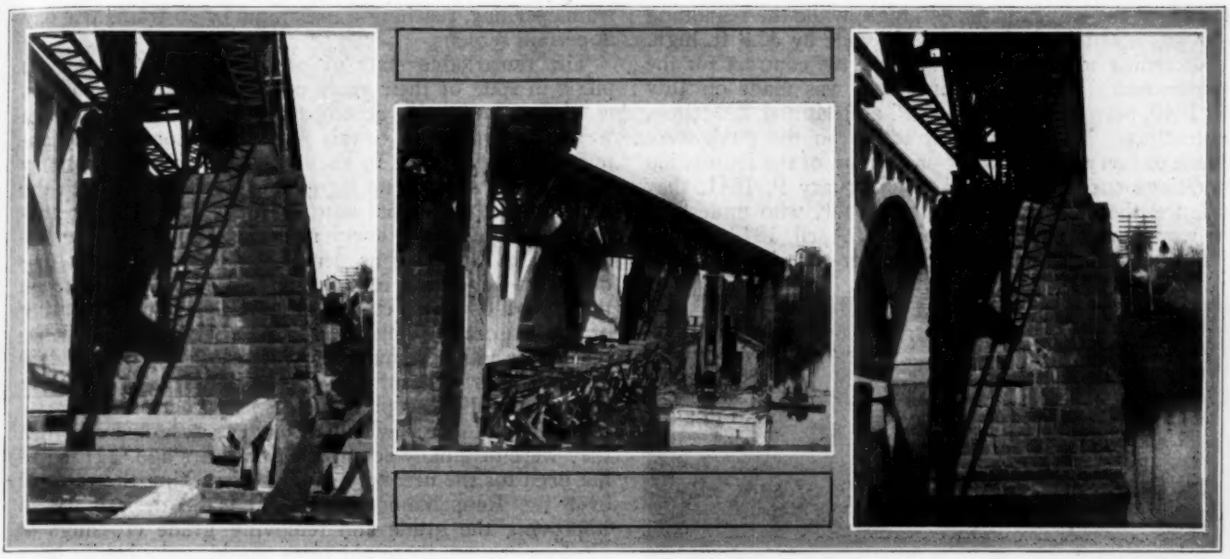


Photo Courtesy J. D. Rogers

Movable Platform for Fueling Locomotives, Uganda Railways



The Old Bridge and a Close-Up of Two of the Piers

Piers Show No Depreciation After 85 Years' Service

Old structures in Rappahannock River are retired when double-track bridge becomes necessary

By E. M. Hastings
Chief Engineer, Richmond, Fredericksburg & Potomac

THAT little or no depreciation actually exists in certain classes of railway fixed structures is demonstrated strikingly by the condition of the old stone masonry piers of the Richmond, Fredericksburg & Potomac's old single-track bridge over the Rappahannock river at Fredericksburg, Va., which are now being taken down following the construction of a new and larger bridge at that point. For 85 years these old piers, together with the original stone masonry abutments of the bridge, have withstood the elements and constantly increasing traffic and loadings, and, from all appearances, they were in as good condition in March of this year as at the time they were built.

The new bridge of the R. F. & P. over the Rappahannock river at Fredericksburg, which brought about the removal of the old bridge and piers, is a double-track, reinforced concrete multiple arch bridge, with five 90-ft. river spans and five 40-ft. shore spans. This new bridge was formally placed in service on May 5, 1927, together with enlarged and modernized passenger station facilities and elevated tracks in the vicinity of the station which eliminated four street grade crossings. The first track on the new bridge was placed in operation on February 21, 1927, and from that date the railroad discontinued using the old single-track deck truss bridge at that point, and the old masonry piers which were constructed for the first crossing of the railroad over the Rappahannock river.

The old piers of this bridge, which were four in number, were made up of granite blocks laid in mortar, and carried spans approximately 125 ft. in length. In each case the piers had slightly battered faces and rested on a rock foundation below the sandy bottom of the river. Three of the piers were approximately 19.3 ft. long by 8

Face of One of the Piers, Showing Condition of Original Pointing

ft. wide at the base, and 45.4 ft. high, while the remaining pier was about 16 ft. long by 8 ft. wide by 35.8 ft. high.

According to the original records, the contract for the construction of these masonry piers was made on July 30, 1840, between the R. F. & P. and Hunter & Melton, contractors. These first contractors on the piers were unable to carry out the work on account of the foundation conditions encountered, and on February 9, 1841, they assigned their contract to Jacob Spahr, who undertook the work and completed the piers in April, 1842.

The contract price for each coffer-dam in the river,

Close View of One of the Piers, Showing a Remarkable State of Preservation

which provided for foundations about 12 to 14 ft. below low tide, was at that time $1,500, while the stone masonry cost $8 per perch. The foundation excavation for the abutments on the shore at either end of the bridge cost 25 cents per cu. yd. These masonry piers and abutments originally carried a wooden bridge, and it is interesting to recall that during the Civil War, two such bridges were burned from these piers. In 1899 a single-track deck truss steel bridge was erected on these same piers and it was this structure which was in use until the new bridge was put in service last February.

The old piers were originally constructed to carry a bridge designed for locomotives weighing probably from 25 to 30 tons, and have withstood the action of the elements and the added weight of locomotive power and equipment throughout the years without any material evidence of disintegration. This is of unusual interest in view of the fact that they have been subject to the action of a water which at times is brackish, flood water reaching to the top of the masonry, and in view of the further fact that for the last two years the R. F. & P. has operated locomotives weighing 582,000 lb. over this bridge in regular service, and for quite a few years locomotives weighing 488,000 lb. During the year just previous to the retirements of the bridge the traffic over it averaged about 50 passenger trains and 25 freight trains per day, reaching a maximum of 96 trains per day at certain seasons.

The remarkable state of preservation of the bridge piers, in spite of their years of service and overloading, is evidenced in the accompanying photographs which were taken in March of this year, just prior to demolishing the old bridge. In each case, the granite masonry of the piers showed no sign of depreciation, and to the naked eye, the original mortar in the joints of the masonry was perfect in every respect. From a careful inspection of the piers as demolished, it was plainly evident that very little re-pointing had ever been done on these piers, as it was easy to observe the original pointing of the masonry. This seems to be very clear evidence that depreciation of masonry piers of this character does not exist, for without question or doubt, at the time of their removal these piers were in as good condition to carry the loads for which they were designed as when they were originally constructed 85 years ago. If it had not been for the necessity of double-tracking the railroad over the Rappahannock river, and the desirability of improving the grade and removing grade crossings at Fredericksburg, these old piers would undoubtedly have continued to give service for some time.

Gatchell Addresses Car Men

AT the Railway Car Department Officers' Convention, held at the Hotel Sherman, Chicago, August 23, 24 and 25, the feature of the opening session was an address by W. H. Gatchell, assistant to the vice-president of the Southern, who made a stirring appeal for the co-operation of railway car inspection and car maintenance forces in reducing the serious drain on railroad resources occasioned by defective and improperly loaded cars with resultant loss and damage claims. These claims on the Southern have been reduced in the past few years from five to less than one per cent of the gross revenues largely by co-operation of all concerned and attention to minor details apparently of little importance. Mr. Gatchell illustrated how these minor defects, resulting in damage claims, can be overcome and said that the condition in which shipments are received is a measure not only of the efficiency of the shipper but of the efficiency of the handling road. He asked for higher standards of car maintenance, smooth inside lining of box cars, better protection around the doors of grain cars, better bracing for automobiles loaded in cars, reduced rough handling and less delay in transferring loaded bad order cars. Mr. Gatchell closed his remarks by paying tribute to the character and efficiency of the modern car man and saying that on him depends, to a considerable extent, further reduction in the loss and damage of freight in transit.

Other addresses and papers read at the Railway Car Department Officers' Convention were as follows: Address by T. W. Demarest, general superintendent of motive power, Pennsylvania, Chicago; individual papers on Selection and Condition of Cars for Loading, by W. J. Owens, chief interchange inspector, Peoria, Ill.; Shop Efficiency, by E. G. Chenoweth, general foreman, Chicago, Rock Island & Pacific, Chicago; Lubrication, by M. J. O'Connors; Loading Rules, by C. J. Nelson, chief interchange inspector, Chicago. In accordance with its usual custom, the association also devoted two sessions to a discussion of the new A. R. A. rules of interchange which become effective January 1, 1928, and the report of the question box committee.

Erie Uses Bill Posting Methods in Material Campaign

Catching attention of users by educational placards reduces waste of supplies

IN connection with the operation of its supply department, the Erie has been placarding bulletin boards and similar places on the property periodically with information adapted to interest employees in the problems of supply work and in the care of material. The posters are all 8½ in. by 11 in. or the size of a standard letter head. They are made from heavy yellow or white enameled cardboard, on which the printing is in black except in the case of the white posters on which on a number of occasions some of the printing has been done in red.

It Pays to Advertise

The use of placards was inaugurated on the assumption that it "pays to advertise" in conducting the supply work of a railroad as well as in the general field of merchandising, but the Erie placards are distinctive in that they are not confined to scare-head slogans and catch phrases alone, but have no educational value in that they set forth in concise terms the aims of the supply department and outline basic facts about material which every user should know. The effort has been to make the placards different from each other, both in printnig and in text. In every placard, however, emphasis is laid on the money value of material and its relation to the revenue dollar. In all cases they have been prepared by the store departments, but to secure the best results they are issued by the operating department under the jurisdiction of the vice-president. The effort has been to appeal to the users' intelligence and interest and to avoid criticism. As a further means of making the placards effective the practice has been followed of adapting the subject matter so as to command the maximum interest of specific classes of employees. Thus, while many of the posters are addressed to the rank and file of employees in all using departments, others are prepared specifically for section men, for bridge and building forces, for locomotive men, for car men, etc.

The treatment of the placards will appear from the illustrations and a resume of some of those which have already been issued. The first was a yellow poster which made its appearance in November, 1923. A total of nine cryptic statements about material, followed by a tabulation of 42 of the principal items of material used daily with their unit costs, comprised the subject matter of this placard, as will appear from the following:

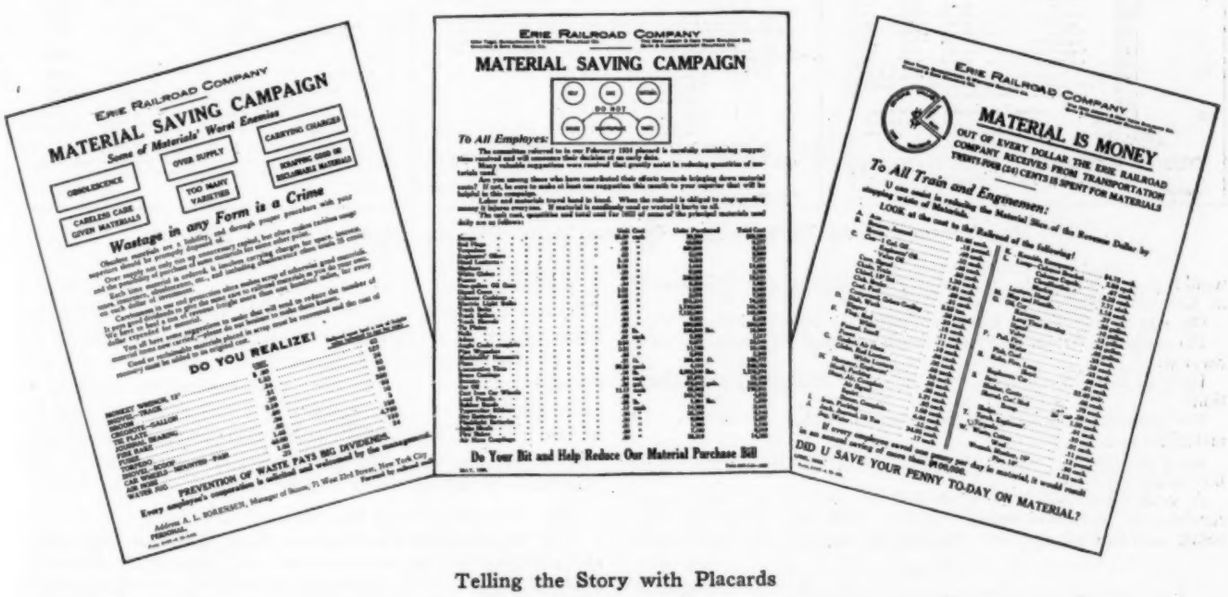
Do Not Waste Materials
This Concerns YOU

To all employees:

Material represents money—save all you can.

Of every dollar earned from operation about 30 cents is spent for material and supplies.

Coal takes 13 cents of every dollar received from operation.


ERIE RAILROAD COMPANY
MATERIAL SAVING CAMPAIGN
Some of Materials' Worst Enemies
OVER SUPPLY
CARRYING CHARGES
OBSOLESCENCE
KEEPING USED OR RECLAIMABLE MATERIALS
TOO MANY VARIETIES
CARELESS CARE GIVEN MATERIALS
Wastage in any Form is a Crime
DO YOU REALIZE!
PREVENTION OF WASTE PAYS BIG DIVIDENDS
ERIE RAILROAD COMPANY
MATERIAL SAVING CAMPAIGN
To All Employes:
Do Your Bit and Help Reduce Our Material Purchase Bill
ERIE RAILROAD COMPANY
MATERIAL IS MONEY
OUT OF EVERY DOLLAR THE ERIE RAILROAD COMPANY RECEIVES FROM TRANSPORTATION TWENTY-FOUR (24) CENTS IS SPENT FOR MATERIALS
To All Train and Engmemen:
DID U SAVE YOUR PENNY TO-DAY ON MATERIAL?

Telling the Story with Placards

Over-ordering of materials means unnecessary investment; however, materials required should always be on hand.

Keep materials in order so that you will always know what is on hand.

As trustee, give your materials the same care and protection you would your own property. Do not misuse or permit it to be misused.

Advise your superior of obsolete materials and materials not needed.

Make correct reports of all materials received and used.

Suggestions as to possible savings in materials, based on service rendered or otherwise, are invited.

The next placard, also yellow in color, was issued in February, 1924, following the inauguration of a ma-

terial saving campaign and comprised an announcement to all employees of a contest for the best suggestions on how to save material. This placard opened with a statement of the volume of purchases on the basis of a year, a month, week, day, hour and minutes, and closed with a list of the prizes, which were $50, $25, $15 and $5, respectively. The text matter of this placard follows:

Material Is Money
Help Save

To all employees:

Material purchases

Per annum	$36,000,000
month	3,000,000
week	690,000
day	98,600
hour	4,105
minute	68

With your co-operation material purchases can be reduced. We carry 60,000 items of material.

Assuming you were paying for the materials, what changes would you make to be sure you were getting the best results at the least cost?

Do you know of any waste in materials now furnished?

Do you know of any unnecessary items of material now carried?

Do you recommend additional items of material for reclamation?

Do you recommend any changes in storing or delivery of materials to users?

Do you know of any materials from which proper service is not being received?

A committee has been appointed to consider all suggestions received up to and including April 1, 1924, and prizes indicated below are offered for best suggestions tending to reduce costs.

Prizes

For best suggestions from entire railroad	$50
For best suggestions from each region:	
1st prize	25
2nd "	15
3rd "	5

Your co-operation is invited in reducing material costs.

In the third placard the unit costs for 35 principal items of material were not only shown, as in the case of the first placard, but the unit purchases and the total cost for these items were also disclosed.

In the next placard (published in October, 1924) the value of material was discussed from the standpoint of its relations to the labor dollar, that is, its equivalent in hours of labor. A message in this case was as follows:

The money available for material expenditures depends upon the net receipts from operation. The less we spend for materials the more is available for labor. Material expenditures represent about 30 per cent of the gross income or two-thirds as much as the total payroll. Saving of materials costs you nothing and causes you no inconvenience; a reduction in hours of employment causes you both loss of money and inconvenience. Handle railroad materials as you would your own and make available more funds for "Labor Dollars."

Be sure you give the "Material Bank" a proper order for all material taken from it. The accounting of a "Material Bank" is no different than that of a savings bank.

Do not let useable material get into scrap even though it is later salvaged; it costs labor hours to do so and adds "cost" without corresponding "value." Scrapping of material than can be economically reclaimed is a waste that you can assist in eliminating.

The railroads are not guaranteed a return by anybody; they have to earn it, and every dollar wasted in materials makes it just that much harder.

In this placard a tabulation of 10 items of material was presented with the unit cost, the total expenditure and the labor equivalent of each.

ERIE
STOP
PLACING GOOD MATERIAL IN SCRAP BINS
To All Employes:
COST OF MATERIALS IS PRICE DIVIDED BY LENGTH OF SERVICE
MATERIAL SAVING CAMPAIGN
WE WILL ALL HELP
Save ERIE Material
To All Employees:
DON'T WASTE! HELP SAVE!
ERIE RAILROAD COMPANY
MATERIAL IS MONEY
FOR EVERY TICK OF THE CLOCK THE ERIE RAILROAD COMPANY SPENDS ONE DOLLAR ($1.00) FOR MATERIAL PURCHASED
To All Shopmen:
A DOLLAR SAVED IS A DOLLAR EARNED
OUR MATERIAL BILL IS SHOWING CONSTANT REDUCTION AND YOUR CO-OPERATION AND SUGGESTIONS ARE REQUISITED

The Main Purpose of the Placards Is to Impress Users with the Money Value of Material

A subsequent placard (issued in March, 1925), in addition to answering a series of questions which had been asked by employees reading previous placards disclosed the number of ton-miles required to produce enough revenue to pay for representative articles, an air hose, for instance, requiring 150 ton-miles; one keg of track bolts, 800 ton-miles; one lantern, 125 ton-miles; one scoop shovel, 150 ton-miles. The questions and answers on this placard are as follows:

(Q) Why should we help to save material?

(A) For at least two reasons; First, it is the duty of each and every one of us not to waste, and particularly that which does not belong to us; second, every dollar's worth of material wasted means that many dollars less available for labor and must result in less employees or working hours.

(Q) How much would be saved per year if every employee saved one cent per day in material?

(A) About $125,000 per year.

(Q) How would that benefit me?

(A) It would permit the spending of more money for labor.

(Q) Has there been any expression of a desire for general co-operation, and are the results satisfactory?

(A) We are getting more and better co-operation than ever before, but the fullest possible results can be realized by and with the hearty co-operation of every employee.

(Q) What average rate per ton does the Erie receive for hauling freight and how many miles would it have to haul a ton of freight to pay for representative items of material used every day?

(A) The Erie received in 1924 an average of 9.66 mills for hauling a ton of freight one mile and it would be necessary to haul one ton the number of miles indicated below to pay for articles mentioned.

1 air hose	150	miles
1 journal bearing	350	"
1 keg track bolts	800	"
1 keg track spikes	600	"
1 lantern, complete	125	"
1 fusee	10	"
1 red globe	100	"
1 scoop shovel	150	"
1 tie plate	30	"

(Q) What else can I do to assist in decreasing expenditures for material?

(A) You can report to your superior, any materials from which we are not receiving full service value or that are not giving complete satisfaction.

In a subsequent placard the attention of employees was called to the loss to this company in money and also its equivalent in ton miles of freight that results when each of 75 or more items, commonly applied to foreign cars, are not recorded on billing repair cars. The tabulation shows, for instance, that failure to report the application of a self-locking handle angle cock represents the loss of revenue from 139 ton-miles of freight. A bottom brake connection represents 207 miles; a new type B-ARA coupler knuckle. 538 ton-miles; a 11-in. journal bearing, 351 ton-miles; and a journal box lid, 114 ton-miles. The message in this placard, printed in red, is as follows:

Be sure to report in accordance with A. R. A. requirements all work done on foreign cars, or we will be obliged to haul above indicated tons of freight one mile to offset the loss.

The next series of white placards issued in August, 1925, continues the material saving campaign with a discussion in red and black on the "worst enemies" of material, supplemented by statistics on the unit cost of specific articles.

Wastage in Any Form Is a Crime

Obsolete materials are a liability, and through proper procedure with your superiors should be promptly disposed.

Over supply not only ties up unnecessary capital, but often causes careless usage and the possibility of purchasing the same materials for some other point.

Each time material is ordered, it involves carrying charges for space, interest, taxes, insurance, obsolescence, etc., and including obsolescence often totals 25 cents on each dollar of investment.

Carelessness in use and protection often makes a scrap of otherwise good materials. It pays good dividends to give the same care to railroad materials as you do your own. We have to haul a ton of revenue freight more than 100 miles, for every dollar expended for material.

You all have some suggestions to make that will tend to reduce the number of material items now carried—please do not hesitate to make them known.

Good or reclaimable materials placed in scrap must be recovered and the cost of recovery must be added to its original cost.

The practice of preparing special placards for different classes of employees was inaugurated in 1926. A yellow poster to all section men listed the unit prices of 60 representative items of material carried on the supply train and not only solicited the co-operation of every section man in preventing the waste of this material, but invited reports of any material that was not giving satisfactory service. A similar card listed the unit cost of principal materials used daily by carpenters, masons, plumbers and painters. Another placard, this time a white placard, going to all shop men, listed the unit cost of shop materials, similarly as was done in previous placards, but different materials were used and the point made with the aid of a drawing that for every tick of a clock the Erie spends one dollar for material purchased. In a similar placard prepared for train and enginemen, the illustration brought out the point that out of every dollar of Erie revenue 24 cents is spent for materials.

Since the inauguration of these placards 15 series have been issued or about one every three months. The number of placards in the first series was limited to 1,500, but this was increased to 3,500 in the subsequent series.

The interest taken in these placards is indicated by the results of the contest in 1924 when approximately 100 replies, some containing two or more suggestions, were received from men in practically every branch of the service. In that contest the first prize for the railroad was won by a machinist, while on one region the first prize for the region went to a locomotive fireman, the second prize to a section foreman and the third prize to a car inspector. On another region, the first prize for the region was awarded to a material clerk and the second and third prizes to machinists; while on the third region the first prize was won by a clerk in the train master's office, the second prize to a boiler foreman, and the third prize to a shop foreman.

In connection with the contest all replies were considered by a committee composed of representatives of the transportation, purchasing, mechanical, stores and engineering departments. The response was highly favorable and resulted in many economies in the care, use and purchase of materials. A sufficient period has elapsed since the first placard was issued to leave the management with no doubts as to the good effects of such publicity.

P. & L. E. Trains Call for Route by Microphone

By I. S. Raymer
Signal Engineer, Pittsburgh & Lake Erie

THE Pittsburgh & Lake Erie is using a microphone and an amplifying projector horn outfit at Belle Vernon Junction interlocking plant, McKeesport, Pa., for transmitting locomotive whistle signals from a point 400 ft. in advance of the annunciator signal to the operator in the signal station. This installation is used for giving the signal operator advance information as to whether the approaching train will proceed through the junction to the Monongahela division or to the Youghiogheny division. With this information the operator is enabled to line up the desired route before the train passes the approach signal, making it possible for it to proceed at maximum scheduled speed.

The 18-mile territory from Pittsburgh east to this point is highly industrialized, the entire distance being within yard limits and as no signal stations or telegraph offices are near the junction, approaching trains are not reported. Previously trains would approach the junction signal station at slow speed prepared to stop, and call for the route when within short whistling distance. Since this installation was put in service trains have been making better time.

The installation consists of a microphone in a box located about 20 ft. from the ground on a pole 400 ft. east and in advance of the annunciator signal, and, in the tower, a horn-type projector and an amplifying outfit. The projector is operative only when the track circuit of the annunciator signal is occupied. The back contact of the track relay cuts in the battery at the microphone and the a.c. current on the amplifier at the signal station.

The order placing this installation in service reads as follows:

"Eastward trains approaching BV interlocking plant will sound whistle for microphone at whistling post of westward main track at the east end of Monongahela Furnace crossover 400 ft. east of signal 150-K as follows: One long moderate blast for Youghiogheny division; 4 short moderate blasts for Monongahela division.

The engine whistle signals given anywhere within 200 ft. on either side of the microphone are transmitted

Microphone and Relay on Pole 400 ft. in Advance of Annunciator Signal

satisfactorily to the signal operator in the signal station where the volume is ample and the tone clear and distinct. In fact, the volume was too great in the signal station until the microphone in the box at the annunciator signal was enclosed in four thicknesses of waxed paper which incidentally protects it from moisture, dust and corroding gases from a nearby blast furnace.

New Tractor Completes Series

THE Elwell-Parker Electric Company, Cleveland, Ohio, has added a lighter duty machine to its mill-type series of electric tractors for use in freighthouse, warehouse, pier, storehouse and shop operations. The new machine, which is of all-steel construction built on the interchangeable parts basis, is designed to handle skid loads in regular power service, while it also elevates the load to heights ranging from 4 ft. to 8 ft. above the floor when used for tiering. It has a capacity of two tons and, with the previous sizes, completes the range up to six tons, so that the series covers practically every high lift operation required in industrial materials and freight handling.

The power plant is of the unit type and consists of an enclosed Elwell-Parker motor, a steel brake drum, steel multi-thread Brown & Sharpe worm to bronze differential cage and cross, chrome-vanadium drive shafts, and universal joints to permit steering and the delivery of power to the steel clutch plates which are bolted to the outside of the drive wheels. These are fitted with solid rubber tires and Timken tapered bearings.

The operator's pedals, one for braking and the other for the controller reverse drum, trip to off-position when they are raised. They are constructed with a heel rest and non-slip surfaces and are equipped with springs so that they fold up when the operator leaves the truck. The braking and power applications are separate to permit incline operation. The machine is equipped with an Elwell-Parker heavy duty drum-type controller in which all fingers are fitted with reversible tips and controller contacts cut from seamless drawn copper tubing. The removable controller handle automatically returns to off-position when released.

The handle used to operate the lift controller is raised to elevate the load and depressed to lower it. An automatic trip device returns the drum-type lift controller to off-position at the instant the load platform reaches its highest or lowest positions, but it can be returned to off-position manually at the will of the operator when the platform reaches any intermediate elevation.

The platform is a solid steel plate with the edges bent into a deep skirt. It has heavy angles welded down the middle to form the attachments for the support arms, each carrying two rollers with long bearings,

The New Tractor Is of All-Steel Construction

which connect with channel uprights which are fitted with a track.

The lift is effected by means of an enclosed type motor with spur gear reduction to double groove drums, which carry the equalized lifting cable.

The main frame, which is built of angles and channels with heavy gusset plates, is rugged in its construction. The lift unit housing which is located between the operator and the platform is fitted with a battery compartment of sufficient size to accommodate any size of battery the service may require, yet the whole machine is compact enough so that short turns in narrow aisles are possible by means of a four-wheel steering gear. The steering is effected by means of a rubber gripped, hinged, horizontal arm. The entire unit is Alemite lubricated.

Since its 26-in. by 54-in. cantilever platform throws great pressure onto the train axle, this is the same size as that used on the three-ton machine, and it is fitted with Timken tapered bearings and 10-in. by 6-in. solid rubber tires. The entire machine is a high speed tool that is built for various heights of lifts and with several sizes of platforms to suit the service required of it. It has been especially designed for use in railway freighthouses, storehouses, warehouses and shops, but is equally suitable for the lighter manufacturing branches of industry.

Baltimore & Ohio's Changed Position

Earning about $13 *a share on basis of recent stock increase*
—Remarkable improvement of past 10½ *years—*
Financial structure greatly improved

THE Baltimore & Ohio has reported net railway operating income for the first half of 1927 1¾ million or 8½ per cent larger than for the corresponding period of 1926. This means that it is reporting net income equivalent after allowance for preferred dividends, to about $20.00 a share on its common stock figured on the basis of the amount of stock outstanding in 1926, when earnings per share were $17.20. In 1925 per share earnings were $12.14.

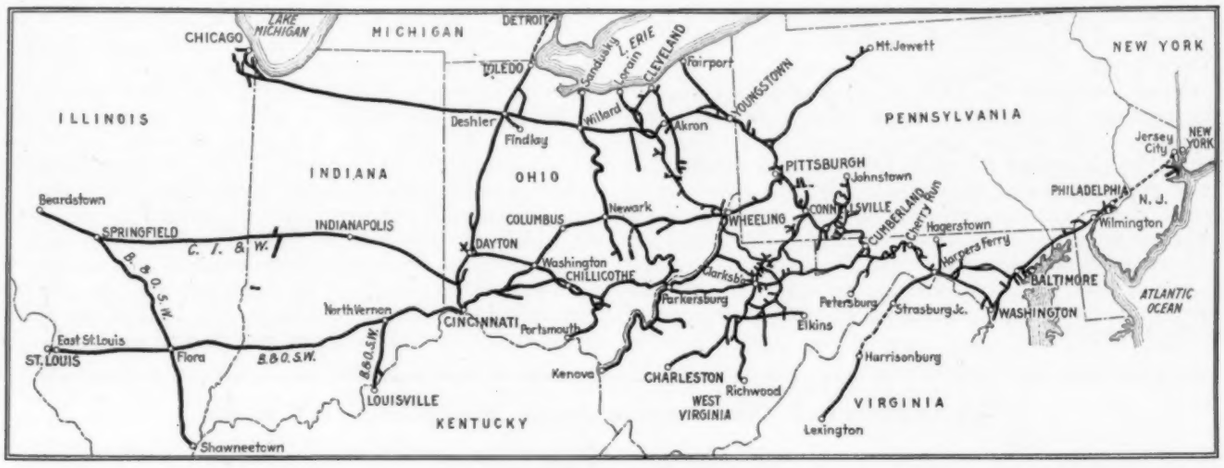
With the full weight of the wage increases in effect in the second half of the year, earnings for the year may not exceed those for the year 1926, but will be about one-half greater than in 1925, almost double those of 1924 and about seven times those of 1922. Such is the remarkable manner in which this property has of late become one of the country's more prosperous railroad systems.

The above estimates of earnings for 1927 are on the basis of the capitalization as it exists at present so as to facilitate comparisons with previous years. Stockholders of the Baltimore & Ohio had, until July 21, the right to subscribe to $63,242,500 common stock at 107½. It is reported that subscriptions totaled about 97 per cent, leaving not to exceed 3 per cent to go to the underwriters. With the reimbursement of the treasury for capital expenditures made out of income during 1926 and 1927, the company was able to meet obligations incurred in the purchase of the Wheeling & Lake Erie and Western Maryland stocks, and is placed in position to anticipate on January 1, 1928, the $35,000,000 10-year 6 per cent notes due 1929 upon which the annual interest charges total $2,100,000. The common stock previously outstanding totaled $151,945,354, and with the new financing it becomes $215,187,854. Had the 10-year notes been paid off before 1926 and had the new stock been outstanding in that year, the earnings on the increased capitalization would have totaled about $13 a share. On the same basis the earnings for the year 1927, as indicated, should make an equally good showing. This, of course, does not take into consideration any income or accruals on the Baltimore & Ohio's recent acquisitions of Wheeling & Lake Erie and Western Maryland stock, information concerning which has not yet been made available.

The 1925 Refinancing

Baltimore & Ohio common stock is at present selling at 121. On the basis of 6 per cent dividends that are being paid on this issue, the yield on the stock is about 4.95 per cent. The price of this stock has ranged this year from a low of 106½ on January 4 to a high of 124⅞, quoted on May 31, just prior to the announcement of the new financing. Considering these, it is hard to believe that this is the same railroad, the stock of which immediately following federal control, reached a low price in 1920 of 27⅝ and in 1921 had a price range between 30⅜ and 42⅜. It is similarly hard to realize now how great was the anxiety at that time regarding the road's ability to meet the pending maturity in 1925 of $130,000,000 of funded debt. In 1921, for instance, the road reported net income of less than 6½ million and in 1922 of less than 4½ million and added to that was the general impression that the road had held its maintenance program to a point not much beyond the necessities of keeping the track safe for operation. Through good fortune, in 1923 the road with a 27 per cent increase in operating revenues had a net income after charges of 22½ million. As a result it was able, in the latter part of the year, to restore at a 5 per cent rate the dividends on its common stock, none of which had been paid since 1919. In May, 1924, it sold $35,000,000 of bonds, in August $75,000,000, and in April, 1925, extended the time payment of $45,000,000, meeting its maturities without difficulty and thereby signalizing a kaleidoscopic improvement in its fortunes and credit.

When this refinancing was completed the Baltimore &



The Baltimore & Ohio

Ohio had no further maturities outside of equipment trusts until 1929. The 1929 maturities included the $35,000,000 10-year 6 per cent notes, so that when they are paid off there will remain no maturities of consequence prior to 1933.

Benefits from Sale of Stock

The Baltimore & Ohio will gain in almost any number of ways from its ability to issue common stock. It will be relieved, as has already been indicated, of 2 million in fixed charges. Inasmuch as there is a wide margin between the amount necessary to retire the notes and the proceeds from the sale of stock, it will succeed in improving very considerably its present already excellent cash position and will be given funds with which to carry out more easily an extensive 1927 additions and betterments program. There is pledged for security for the notes a large proportion of the Baltimore & Ohio's holdings of Reading stock. This will be released, as will also 24½ million refunding and general mortgage bonds, which can be sold if desired or pledged for temporary borrowing if the need should arise. More important than these, however, will be a decided improvement in the capital structure of the railroad.

At present, the company's bonded debt and capitalized leaseholds total 73.4 per cent of its total capitalization, whereas after the issuance of the new stock and the retirement of the 10-year notes this will be reduced to 66.8 per cent.

As of December 31, 1926, the Baltimore & Ohio had outstanding $581,973,441 long term debt, including equipment obligations and capitalized leaseholds. Its capital stock totaled $210,808,535 of which $58,863,181 is 4 per cent preferred and $151,945,354 common on which 6 per cent dividends are now being paid. When the new financing is effected, the funded debt including capitalized leaseholds will total $550,829,157 and the common stock will have been increased to $215,187,854, giving a total stock, inclusive of the preferred, of $274,051,035.

Changes in Last 10½ Years

On June 30, 1916, the road had an investment in road and equipment amounting to 563 million dollars. On December 31, 1926, this had increased to 822 million, an increase of 259 million or 46 per cent. This amounts to some 24 million annually over the period in question. The stock outstanding on June 30, 1916, was the same as at present, but the total capitalization was 628 million as compared with 793 mililon as of December 31, 1926, showing an increase of 165 million. This means that the increase in road and equipment, exclusive of the road's other investments, such as its holdings in Reading stock, etc., had increased 94 million more than its capitalization. The figure is more striking if it is realized that this excess of increase in investment over increase in capitalization is equivalent to $62 a share on the common stock at present outstanding. Carrying the comparison further and taking into consideration the pending retirement of the 10-year notes and the addition of 63 million of stock, the difference becomes no less than $30 on the common stock outstanding, including the additional 63 million.

Increase of 83 Per Cent Over Standard Return

In the year ended June 30, 1916, the road had net income after interest charges of 13½ million which compared with the 28½ million which it earned in 1926. Its net railway operating income in 1916 was 27 million as compared with the 50.8 million reported in 1926 and the rate of return in 1916 was 4.7 per cent whereas in 1926 for the system as a whole the return was 5.8 per cent. Furthermore, it appears that the road's revenue ton-miles in 1926 increased 32½ per cent over 1916 whereas in the same time the Great Lakes region showed an increase of 9 per cent and the Central Eastern region in which the Baltimore & Ohio is included reported an increase of 19 per cent and the roads of the country as a whole, 30 per cent. The company's revenue per ton per mile in 1916 was 0.560 cent. In 1926 it was 0.993 cent, an increase of 72½ per cent as against the Central

Table I—Baltimore & Ohio, Operating Results, Selected Items, 1916 to 1926

	(June 30) 1916	1918	1919	1920	1921	1922	1923	1924	1925	1926
Mileage	4,539	5,152	5,154	5,155	5,235	5,212	5,207	5,196	5,196	5,197
Total oper't'g revs.	$111,668,680	$175,259,575	$182,620,016	$231,944,443	$199,077,853	$200,843,170	$255,594,435	$224,318,795	$237,546,940	$252,361,830
Total oper't'g exps.	79,319,804	161,933,591	170,348,032	226,399,307	167,072,093	165,021,375	199,323,961	172,752,632	179,099,597	186,306,273
Net operating revenues	32,348,876	13,325,984	12,271,984	5,545,136	32,005,760	35,821,795	56,270,474	51,566,163	58,447,343	66,055,557
Other operating charges—										
Taxes	3,674,248	5,074,636	5,379,037	6,977,934	7,286,262	6,769,093	9,834,129	9,548,086	10,064,868	11,843,416
Equipment rents, net Dr.	1,106,776	1,155,252	2,164,848	2,480,107	1,799,000	3,957,431	3,139,711	2,956,055	4,368,704	2,084,035
Joint facility rents, net Dr.	487,391	403,060	478,023	469,601	937,163	1,274,445	1,032,218	874,625	926,233	1,089,021
Total other operating charges	5,303,979	6,652,778	8,042,979	9,972,155	10,064,064	12,086,790	14,137,345	13,481,839	15,413,256	15,250,220
Net railway operating income	27,044,897	6,673,206	4,229,005	(Def.)4,427,019	21,941,696	23,735,005	42,133,129	38,084,324	43,034,087	50,805,337
Other income	4,865,998	5,200,951	5,221,419	5,399,859	10,125,088	6,187,132	6,032,521	5,657,290	6,489,977	6,890,426
Gross income	31,910,895	*22,945,691	*32,266,717	*31,834,154	32,066,784	29,922,137	48,165,650	43,741,614	49,524,064	57,695,763
Interest on funded debt	17,478,809	19,060,886	19,640,622	21,960,591	22,761,053	22,810,616	23,333,143	24,950,935	26,478,252	27,439,262
Total deductions from gross income	18,218,448	27,903,595	23,686,695	24,588,673	25,677,893	25,546,764	25,743,614	27,421,924	28,730,556	29,201,469
Net income	13,692,447	5,042,106	8,580,022	7,245,481	6,388,891	4,375,373	22,422,036	16,319,690	20,793,508	28,494,294
Dividends on preferred stock, 4 per cent	2,354,527	2,354,531	2,354,531	2,354,531	2,354,529	2,354,527	2,354,527	2,354,527	2,354,527	2,354,528
Dividends on common stock	(5)7,597,225	(4½)6,837,433	(2)3,038,858	.....	.....	.....	(2½)3,798,570	(5)7,597,338	(5)7,597,270	(6)9,116,725
Total dividends	9,951,752	9,191,964	5,393,389	2,354,531	2,354,529	2,354,527	6,153,097	9,951,865	9,951,797	11,471,253
Surplus	3,740,695	(Def.)4,149,858	3,186,633	4,890,950	4,034,362	2,020,846	16,268,939	6,367,825	10,841,711	17,023,041
Revenue ton-miles (thousands)	15,793,945	17,032,281	17,203,592	20,932,667	14,209,155	15,053,799	20,616,285	17,532,965	19,459,443	20,937,488
Revenue passenger-miles (thousands)	747,860	1,177,565	1,240,145	1,060,218	895,254	810,848	942,330	902,528	878,442	889,389
Revenue per ton-mile (cents)	.560	.763	.795	.873	1.103	1.060	1.012	1.028	.995	.993
Transp'tat'n ratio	33.0	45.3	43.6	49.1	43.0	41.0	37.0	38.0	35.62	34.68
Operating ratio	71.03	92.40	93.28	97.61	83.92	82.16	77.98	77.01	75.40	73.83
Per ct. of net operat'g income to tot. operat'g revenues	24.2	3.8	2.3	.....	11.0	11.8	16.5	17.0	18.1	20.1

*Includes standard return or guaranty. Standard return for operations during federal control was $27,744,740.

Eastern region's increase of 66 per cent, a difference due in part to important changes in the character of the traffic. The increase in net railway operating income, however, which is the result of increases in traffic, changes in the rate level and also efficiency of operation, was 88 per cent.

The Baltimore & Ohio's net railway operating income for the year ended June 30, 1916, was slightly less than the standard return for operations during federal control and the increase in 1926 over the standard return was 83 per cent, which compared with an increase for the Central Eastern region of 48 per cent, for the Great Lakes region of 43 per cent and for the country as a whole of 36 per cent. These comparisons are made with due regard to the fact that the Baltimore & Ohio meets some of its strongest competition from the roads in the Pocahontas region, which have had greater increases in their

Table II—Comparison of Selected Freight Operating Statistics

	1926	1920	Per cent of change Inc.	Dec.
Mileage operated	5,196	5,154	0.8	....
Gross ton-miles (thousands)	46,293,252	41,033,959	12.8	....
Net ton-miles (thousands)	22,280,055	21,663,077	2.8	....
Freight train-miles (thousands)	24,271	23,978	1.2	....
Freight locomotive-miles (thousands)	30,559	30,009	1.8	....
Freight car-miles (thousands)	1,132,437	939,545	20.5	....
Freight train-hours	2,387,545	2,751,268	....	13.2
Tons of coal consumed by freight locos.	4,385,566	4,621,067	....	5.1
Car-miles per day	30.0	24.4	23.0	....
Net tons per loaded car	31.7	34.9	....	9.2
Per cent loaded to total car-miles	62.0	66.1	....	4.1
Net ton-miles per car day	591	562	5.2	....
Freight cars per train	47.7	40.2	18.7	....
Gross tons per train	1,907	1,711	11.5	....
Net tons per train	918	903	1.7	....
Train speed, miles per train-hour	10.2	8.7	17.2	....
Gross ton-miles per train-hour	19,389	14,915	30.0	....
Net ton-miles per train-hour	9,332	7,874	18.5	....
Lb. coal per 1,000 gross ton-miles	166	.....	....	....
Loco.-miles per loco.-day	68.5	62.2	10.1	....
Per cent freight locos. unserviceable	15.9	19.0	....	3.1
Per cent freight cars unserviceable	4.1	6.5	....	2.4

their traffic and net than has the Baltimore & Ohio, because they have moved up to an entirely different position from that of 1916 because of the growing importance of non-union coal. The road in southern territory having secured to themselves not only substantially all the increase in coal production but much of the tonnage formerly coming from the Pennsylvania and Ohio fields. However, it would appear that in a comparison with the roads to the north, the Baltimore & Ohio has also moved into an entirely different and very much improved position from that which it formerly held.

Coal

There is a general impression that the Baltimore & Ohio has gradually gotten away from being predominantly a coal carrier. This, however, is only in a measure true. While the road's total tonnage in 1926 was 38½ per cent greater than in 1916, the increase in the coal tonnage was 51 per cent. In 1916 bituminous coal constituted 42.6 per cent of the total revenue tonnage; in 1926 it was 46.6 per cent. In view of the Baltimore & Ohio's recent acquisition of a large block of Western Maryland stock it should be noted that while a large proportion of the eastbound coal moves to Baltimore a large tonnage leaves the Baltimore & Ohio at Cherry Run and moves thence over the Western Maryland to Shippensburg where it is turned over to the Reading for points in Pennsylvania, New York and New England.

The Baltimore & Ohio owns jointly with the New York Central about 50 per cent of the Reading stock. It is customary to emphasize the importance of this interest to the Baltimore & Ohio because the Reading and the Jersey Central which it controls by a majority stock ownership, give the Baltimore & Ohio its connection between Philadelphia and New York. It should also be realized that the Reading carries between Williamsport and Shippensburg and the seacoast and for New York and New England enough bituminous coal so that the Reading bituminous tonnage has for some time exceeded its anthracite tonnage, even though the Reading is the largest carrier of anthracite.

Tabular Comparisons

Table I and the material in the first two or three paragraphs of this article complete the brief financial history of the past ten and one-half years. The striking feature of the table is the unfortunate decline of earning power immediately following federal control. This is shown in the figures of net railway operating income, the net income after charges, the omission of common dividend payments and the excessive increase in the transportation ratio and the operating ratio, followed then by a steady and striking improvement up to 1926. In this table probably no figure is more interesting than the last one showing the percentage of net railway operating income to total operating revenues. It will be noted that there was a deficit in 1920. In 1921 the percentage was 11 whereupon it steadily increased until in 1926 it was 20.1. This is still below the 24.2 of the year ended June 30, 1916, but it compared with percentages of net operating income to total operating revenues in 1926 of 19.0 per cent for the Great Lakes region, 17.1 per cent for the Central Eastern region and 19.1 per cent for the United States as a whole.

Table II shows a brief comparison of the operating statistics of the Baltimore & Ohio in 1926 as compared with 1920. In 1926 the Baltimore & Ohio handled the largest freight traffic in its history although it is true that the revenue ton-miles did not exceed those of 1920 by a very large margin. The increase in gross ton-miles was 12.8 per cent which by improved efficiency was moved with only 1.2 per cent increase in its freight train-miles and with a reduction in its freight train-hours of only 13.2 per cent and a decrease in coal consumption of 5.1 per cent. The table shows an increase of 30 per cent in gross ton-miles per train hour.

What of the Future?

A short time ago the *Railway Age* commented on the fact that improvement in railway earnings in recent years had in some instances been almost kaleidescopic. This seems to be decidedly the case with the Baltimore & Ohio. There is no reason to believe that the improvement is not going to continue although, of course, one cannot expect that the percentage of increase will be anywhere near as great as it has been in the past three or four years, or even during the last 10½ years.

A peculiarly interesting feature at this time will be the result of the company's recent acquisition of Wheeling & Lake Erie and Western Maryland stock. Both these companies are reporting much larger earnings than formerly and apparently it is only a question of time before they may be paying dividends, in which case the Baltimore & Ohio will be helped accordingly. Furthermore, there is always the interesting situation concerning the road's interest in the Reading which in 1926 reported net earnings of no less than $11.24 on its $50 par value common stock and paid 10 per cent ($5 per share). It seems to be conceded if railroad consolidations in the East are to be carried out, the co-ordination of the Reading and Central of New Jersey with the Baltimore & Ohio is the logical outcome, in which event an even stronger system with assured earning power would be realized.

Small Increase in Ties Treated During 1926

ALTHOUGH more cross ties were subjected to preservative treatment in the United States during 1926 than in any previous year, the increase over the number treated in 1924, the previous high record, amounted to only 21,828 ties. In other words, there has been no substantial change in the number of ties treated during the last three years, the total being slightly more than 62½ million ties in each of the years 1924, 1925 and 1926. More substantial gains in the practice of treating timber are noted in other classifications recognized in the statistics on timber preservation prepared by R. K. Helphenstine, Jr., for the United States Department of Agriculture in co-operation with the American Wood-Preservers' Association. The greatest numerical increase occurred in the treatment of poles, 49,511,089 cu. ft. being treated in 1926 as compared with 42,204,413 cu. ft. in 1925. The largest proportional increase in any of the principal classifications was in cross arms, 1,344,406 cu. ft. being treated in 1926 as compared with 621,705 cu. ft. in 1926, or a gain of over 116 per cent. In the case of wood blocks the treatment of which had experienced a decline from 10,145,724 cu. ft. in 1911 to 3,408,489 cu. ft. in 1925, there was an increase to 3,689,424 cu. ft. in 1926. The total volume of wood for all purposes treated in 1926 was 289,322,079 cu. ft., a gain of 14,847,541 cu. ft. over the previous high total in 1925.

Creosote continues to be the primary preservative material, a larger quantity being applied in 1926 than in any previous year. The total for that year was 185,733,180 gal. as compared with 167 642,790 gal. in 1925. Of the total quantity used last year, 90,290,066 gal. was domestic creosote, while 95,443,144 gal. was imported. The use of zinc chloride suffered a further reduction during the last year, being employed to the extent of 24,777,020 lb. as compared with 26,378,658 lb. in 1925, and 51,375,360 lb. in 1921, the greatest quantity used in any one year. Other materials used in preserving wood last year included 13,317,022 gal. of petroleum oil, 2,541,563 gal. of paving oil, and 259,961, gal. of miscellaneous preservatives.

Of all the cross ties treated 37,429,092 were hewed and 25,225,446 were sawed. A total of 38,233,247 ties were treated with creosote, 9,376,380 were treated with creosote-petroleum mixture, 11,826,859 were treated with zinc chloride, 3,128,377 with creosote-zinc emulsion, and 89,675 with other preservatives.

Two of the tables show the quantities of piles and poles treated in 1926, classified according to species of wood. Eighty-five per cent of all piles or 15,670,861 lineal feet were southern pine, and 53 per cent of all poles or 1,495,393 were cedar. The tables of miscellaneous materials show that there has been a marked increase in the treatment of car material, fence posts and tie plugs and an equally marked reduction in the treatment of crossing planks.

Wood Preservation, 1909-1926, Together With Consumptoin of Creosote and Zinc Chloride

Year	Total Material Treated Cu. Ft.	Number of Cross Ties Treated	Creosote Used, Gal.	Zinc Chloride Used, Lbs.
1909	75,946,419	20,693,012	51,426,212	16,215,107
1910	100,074,144	26,155,677	63,266,271	16,802,532
1911	111,524,563	28,394,140	73,027,335	16,359,797
1912	125,931,056	32,394,336	83,666,490	20,751,711
1913	153,613,888	40,260,416	108,378,359	26,466,803
1914	159,582,639	43,846,987	79,334,606	27,212,259
1915	140,858,963	37,085,585	80,859,442	33,269,604
1916	150,522,982	37,469,368	90,404,749	26,746,577
1917	137,338,586	33,459,470	75,541,737	26,444,689
1918	122,612,890	30,609,209	52,776,386	31,101,111
1919	146,060,994	37,567,927	65,556,247	43,483,134
1920	173,309,505	44,987,532	68,757,508	49,717,929
1921	201,643,228	55,383,515	76,513,279	51,375,360
1922	166,620,347	41,316,474	86,321,389	29,868,639
1923	224,375,468	53,610,175	127,417,305	28,830,817
1924	268,583,235	62,632,710	157,305,358	33,208,675
1925	274,474,538	62,563,911	167,642,790	26,378,658
1926	289,322,079	62,654,538	189,733,180	24,777,020

Miscellaneous Material Treated—1926

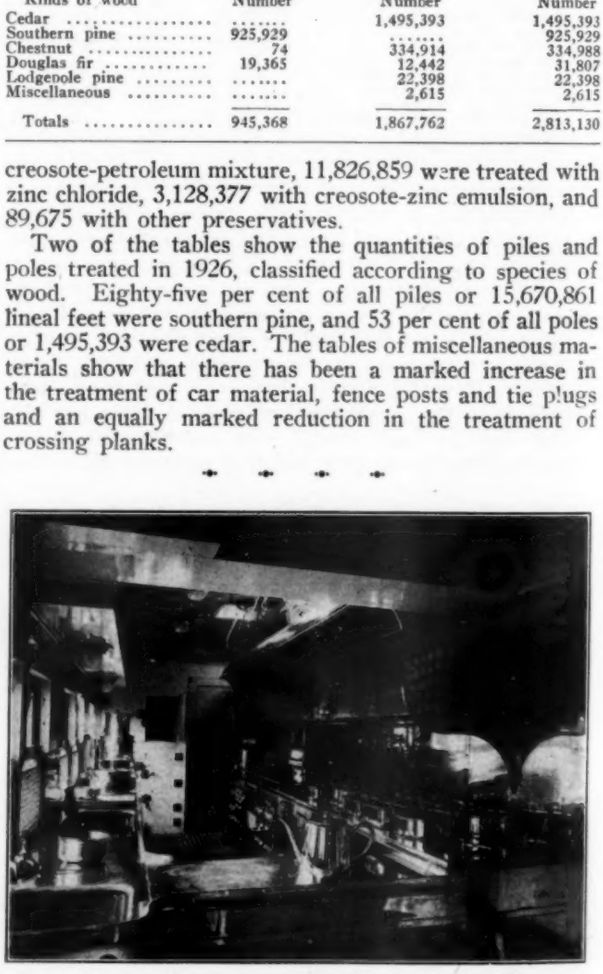
Kind of Material	Total
Lumber	12,255,609
Fence Posts	6,742,132
Conduit	4,436,163
Car Material	2,954,088
Tie plugs	2,664,459
Pipe staves	2,555,804
Mine timber	1,360,903
Anchor logs	1,100,828
Silo material	1,086,683
Vehicle stock	1,031,134
Trunking and capping	777,440
Barge material	714,914
Crossing plank	286,008
Pole stubs	258,412
Drain boxes	141,934
Fence planking	129,996
Shingles	112,020
Pile heads	92,048
Insulator pins	56,250
Tie shims	38,376
Meterbox material	23,399
Sign posts	3,624
Miscellaneous	121,173
Total	38,943,397

Piles Treated—1926

Kind of wood	Creosote (Lineal feet)	Creosote-petroleum (Lineal feet)	Zinc chloride (Lineal feet)	Total (Lineal feet)
Southern pine	15,578,466	.....	92,395	15,670,861
Douglas fir	2,242,711	64,657	.....	2,307,368
Cypress	202,209	.....	.....	202,209
Cedar	129,015	.....	.....	129,015
Oak	15,294	.....	.....	15,294
Miscellaneous	41,328	.....	.....	41,328
Total	18,209,023	64,657	92,395	18,366,075

Poles Treated—1926

Kinds of wood	Full pressure treatment Number	Butt treatment only Number	Total Number
Cedar	.....	1,495,393	1,495,393
Southern pine	925,929	.....	925,929
Chestnut	74	334,914	334,988
Douglas fir	19,365	12,442	31,807
Lodgepole pine	.....	22,398	22,398
Miscellaneous	.....	2,615	2,615
Totals	945,368	1,867,762	2,813,130



Kitchen in New Victorian Railway Dining Car

A Diagnosis of Rail Failures

Freight car truck springs going solid on both curves and straight track suggested as a cause

By T. H. Symington

ONE of the most difficult problems for complete and correct diagnosis in modern railroad operation has to do with rail failures. The subject is so complex that it would seem essential to diagnose the trouble properly, so that effective remedies can be applied.

An article in the *Railway Age* of July 16, 1927, "Stress in Rails has Important Bearings on Failures" shows a definite relationship between static axle loads in rail sections of 100 and 115 lb. and the resulting rail failures. It is evident that the girder strength of rails must be sufficient to carry existing equipment safely. Some railroads are now using 130-lb. rails on main line track and a rail section of 150 lb. per yard is being considered to further increase the girder strength.

No one maintains that the girder strength of a rail is its only necessity, and no one can say what the future maximum section standard rail will be. It is well known that it is much more difficult to obtain uniformity in the steel of the heavier rail sections than in the old lighter sections.

Modern research has led to locomotive design that minimizes the dynamic augment incident to the main locomotive driving wheels and a great deal of study is being given to excessive pressures incident to the wheels of heavy freight cars. These excessive car wheel pressures occur when car roll by some means is not prevented.

W. P. Borland, Director of the Bureau of Safety, Interstate Commerce Commission, in the *Railway Age* of December 26, 1925, is quoted as follows:

> The problem is one of physics, as rails will fracture when exposed to strains which are beyond their ability to endure, the same as other engineering members will. The trouble seems to have been in the failure to recognize the influence and effect of intense concentrated loads, which are peculiar to and always present where loads are carried on wheels. Girder strength of the rail is not the prime consideration. If it were, rails would fracture from the base instead of the interior of the head. The crux of the problem is in the intense impinging pressures at the area of contact between the tread of the wheel and the head of the rail. . . . Hope for improvement lies in the direction of finding a steel having a higher limit of endurance against present track strains, one which has a margin above any known grade of steel familiar to the arts. There is no hope for immunity against the display of transverse fissures in present track structures exposed to current strains.
>
> A state of finality undoubtedly admits of being reached in the endurance of steels. If judgment is at fault in the belief that the prevention of transverse fissures under present wheel loads on present grades of steel is impossible, a great service will be performed by any person who will present conclusive evidence which will correct that judgment.

In the April 17, 1926, issue of the *Railway Age*, James E. Howard, engineer-physicist, Bureau of Safety, Interstate Commerce Commission, is quoted:

> It is not to the point whether one rail displays a transverse fissure and another does not, but why does a fractured rail fracture? Where wheel pressures are mentioned reference is made to the influence and effects of the intense impinging pressures at the contact surfaces of the treads of the wheels and the running surfaces of the heads of the rails. Here lies the crux of the situation, and here is located, practically, the entire rail problem.

Impinging Bearing Stress on the Rail

The above conclusions have nothing to do with the girder strength of the rail. It seems important, therefore, to differentiate between the two kinds of high vertical stress to which rails are subjected: first, bending stress in the rail as a beam; second, impinging bearing stress on the head of the rail. Either of these stresses, or a combination of both, may result in ultimate rail fractures. Transverse stresses in rails from wheel flanges are not under consideration.

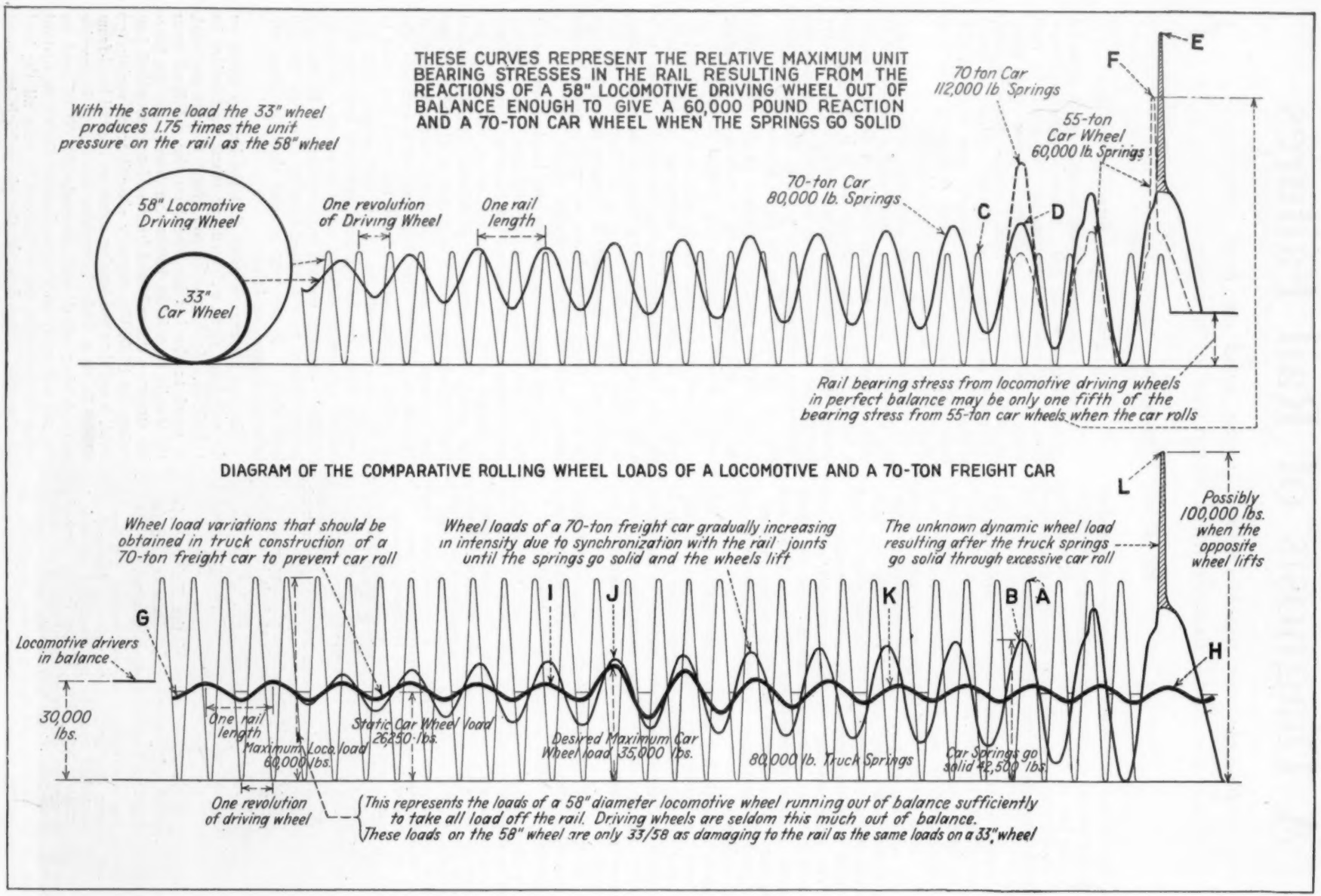
It is difficult to diagnose accurately dynamic impinging pressures, because we have become accustomed to gage the extent of shocks by sound. A flat wheel makes a lot of noise and we assume that it is doing an immense amount of damage. When the springs of a heavy freight car go solid there is no sound to indicate the tremendous impinging stress put into the small contact area on the rail head by the 33-in. wheels.

The diagrams give a comparison of the wheel pressures and unit bearing stresses in rails at the impinging contact between locomotive and freight car wheels.

The bottom diagram, which deals with wheel loads irrespective of the areas of impinging contacts, shows that the badly balanced locomotive driving wheel puts a 40 per cent greater bending stress in the rail indicated at *A* than the bending stress at *B* from a 70-ton car wheel just before its 80,000-lb. capacity five-coil springs go solid. These are the forces we must consider in connection with the girder strength of the rail.

The top diagram deals with unit bearing stresses on the rail head from locomotives and cars. This bearing stress from a badly balanced locomotive driving wheel is shown at *C*. The bearing stress from a 70-ton car wheel, just before its 80,000-lb. capacity five-coil truck springs go solid, is indicated at *D* and is 25 per cent greater. If we use seven-coil truck springs of 112,000 lb. capacity, and if the car roll is sufficient, the car wheel bearing stress on the rail head just prior to spring closure would be 75 per cent greater than the bearing stress on the rail head resulting from the 60,000-lb. locomotive driving wheel re-action. Similarly, 89,000-lb. capacity six-coil truck springs on 55-ton cars before closure give a wheel bearing stress on the rail head that is 38 per cent greater than the same unbalanced locomotive driver.

The last statements mean that the bearing stress on the rail head from a 70-ton car wheel, just before its 112,000-lb. capacity seven-coil truck springs go solid, is equal to the bearing stress on the rail head from 105,000 lb. on a 58-in. locomotive driver; also the bearing stress on the rail head from a 55-ton car wheel, just before its 89,000-lb. capacity six-coil truck springs go solid, is equal to the bearing stress on the rail head from 82,800 lb. on a 58-in. locomotive driver. A locomotive main driving wheel with normally 30,000 lb. load on the rail will apply only approximately 60,000 lb. of load when it is enough out of balance to take all the load off the rail. Obviously, if the above high car wheel


THESE CURVES REPRESENT THE RELATIVE MAXIMUM UNIT BEARING STRESSES IN THE RAIL RESULTING FROM THE REACTIONS OF A 58" LOCOMOTIVE DRIVING WHEEL OUT OF BALANCE ENOUGH TO GIVE A 60,000 POUND REACTION AND A 70-TON CAR WHEEL WHEN THE SPRINGS GO SOLID
With the same load the 33" wheel produces 1.75 times the unit pressure on the rail as the 58" wheel
58" Locomotive Driving Wheel
33" Car Wheel
One revolution of Driving Wheel
One rail length
70-ton Car 80,000 lb. Springs
70 ton Car 112,000 lb Springs
55-ton Car Wheel 60,000 lb. Springs
C
D
E
F
Rail bearing stress from locomotive driving wheels in perfect balance may be only one fifth of the bearing stress from 55-ton car wheels when the car rolls
DIAGRAM OF THE COMPARATIVE ROLLING WHEEL LOADS OF A LOCOMOTIVE AND A 70-TON FREIGHT CAR
Wheel load variations that should be obtained in truck construction of a 70-ton freight car to prevent car roll
Wheel loads of a 70-ton freight car gradually increasing in intensity due to synchronization with the rail joints until the springs go solid and the wheels lift
The unknown dynamic wheel load resulting after the truck springs go solid through excessive car roll
Possibly 100,000 lbs. when the opposite wheel lifts
G
I
J
K
B
A
L
H
Locomotive drivers in balance
30,000 lbs.
One rail length
Maximum Loco. load 60,000 lbs.
Static Car Wheel load 26,250 lbs.
Desired Maximum Car Wheel load 35,000 lbs.
80,000 lb. Truck Springs
Car Springs go solid 42,500 lbs.
One revolution of driving wheel
This represents the loads of a 58" diameter locomotive wheel running out of balance sufficiently to take all load off the rail. Driving wheels are seldom this much out of balance.
These loads on the 58" wheel are only 33/58 as damaging to the rail as the same loads on a 33" wheel

Comparison of Wheel Pressures and Unit Bearing Stresses in Rails

bearing stresses were bending stresses, the entire roadbed would be quickly destroyed.

It is evident that, if 112,000-lb. capacity seven-coil truck springs are used instead of 80,000-lb. capacity five-coil truck springs on 70-ton cars, the high shock bearing stress on the rail head *E* is better avoided, unless cumulative roll with 80,000-lb. capacity five-coil truck springs is prevented. The same is true regarding the shock bearing stress *F* from 55-ton cars with 89,000-lb. and 64,000-lb. capacity truck springs respectively.

Referring again to the bottom diagram, the sinuous line *G-H* shows a normal variation in wheel load of a 70-ton freight car with 80,000-lb. capacity five-coil truck springs on a normally maintained track without cumulative car roll. This sinuous line *G* to *I* shows a variation in wheel pressures corresponding to a movement in the truck springs of ¼ inch. This is usual on good track. Point *J* indicates a wheel pressure of 35,000 lb. which corresponds to an occasional movement of ¾ inch in the truck springs. The line from *J* to *K* shows this high vibration quickly diminishing to the normal vibration shown from *K* to *H*. With cumulative roll, this 35,000-lb. pressure may increase to the shock peak *L*, of possibly 100,000 lb. An instantaneous dynamic pressure of 100,000 lb. from a 33-in. wheel would put a bearing stress on the rail head equal to an instantaneous bearing stress of 175,000 lb. from a 58-in. locomotive driver. This comparative bearing stress of 175,000 lb. must be increased in the same proportion as the penetrative hardness of a chilled iron car wheel exceeds the penetrative hardness of a rolled steel locomotive driving wheel tire. These figures are not based on theory, but on well-known principles of physics and cannot be ignored.

Rigid Body Cars on Curves

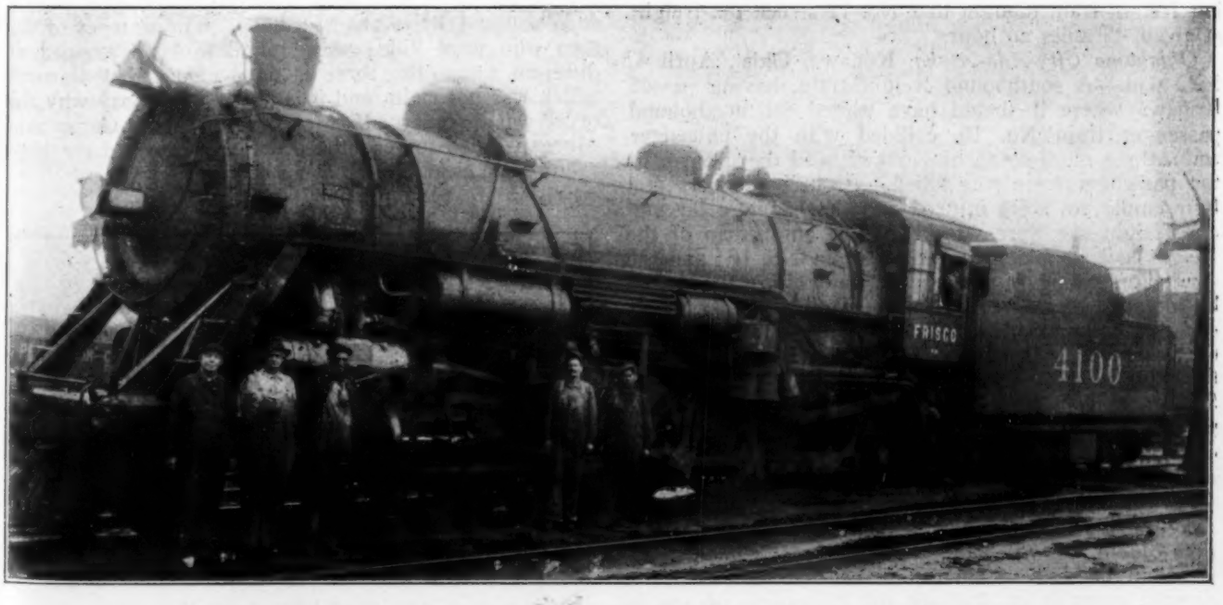
The problem on curves with rigid body cars is not one of impinging pressures but of derailments. Such derailments are caused always by high pressure of the wheel flanges against the rail, accompanied by an unloading of the truck springs on the same side of the truck. If high flange pressure against the rails could be eliminated, rigid body cars with wood blocks instead of springs could be run safely around any curve. The supports of the rigid cars would then be on any three points on the two body bolsters, each centre plate being either one or two points, depending on whether or not it is cocked. The maximum load on the rail from one wheel would occur when the entire weight of one end of the car came on one side bearing. This load could not exceed 33,600 lb for a 55-ton car. This condition would not absorb all the travel in any one of the standard 64,000-lb. capacity four-coil truck springs on a 55-ton car.

We must conclude that the locomotive driving wheel is the worse offender in stressing the rail as a beam. On account of its diameter however, its large bearing area on the rail head is within safe limits. The 33-in. car wheel, with its small bearing area on the rail head, is obviously the worse offender in producing high impinging bearing stresses on the rail head. These bearing stresses, coupled with its normal bending moment, make the car wheel the largest factor in damaging the rail.

It seems imperative, therefore, that in order to help the rails, we first insure against the car wheel peak shock stresses and then reduce the high car wheel impinging pressures by minimizing car roll.

Only the wheels of one pair of drivers on a locomotive produce the very high bending stresses from dynamic augment. Because in a 100-car train there are 400 more car wheels on the rails than there are main drivers of a locomotive, attention is automatically focused on the damage to the rail head from freight car wheels. Peak shock stresses received from freight car wheels cause serious damage to the rail head below its running surface.

The small, continuous wave action produced in the rail by the bending moments from innumerable car wheels will cause the destroyed fibres in the rail head to develop by detail fracture into a transverse fissure.



St. Louis-San Francisco Locomotive No. 4100 at the Completion of its 2,940-mile Run

Left to Right—S. G. Manlove, road foreman; D. L. Forsythe, general road foreman; Frank Ellis, road foreman; A. H. Brake, engineman, and George W. Underwood, fireman. See the August 20, 1927, issue of the *Railway Age*, page 342, for an account of the performance of this locomotive

Accident Investigations—April*

IN the month of April, 1927, the Bureau of Safety of the Interstate Commerce Commission investigated three collisions and one derailment. Abstracts of the reports of W. P. Borland, director of the Bureau, on these cases are given below:

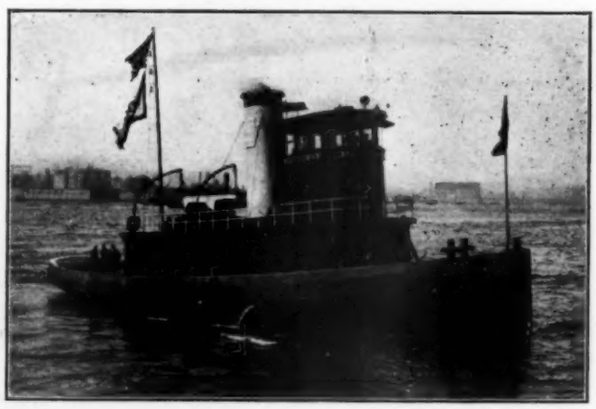
Central of Georgia, Echeconnee, Ga., April 3, 1:23 a.m. —Westbound freight extra 667 which had been stopped preparatory to entering the passing track was run into by eastbound passenger train No. 12, consisting of a locomotive and 11 cars; and the fireman of the passenger train was killed; 19 passengers and one employee injured. An express car in the passenger train was crushed and two cars of the freight train fell off a trestle and lodged in the bed of the creek below. The passenger train had run past a semi-automatic signal set against it and the engineman of this train is held responsible for the collision. This signal is the first one to be encountered by an eastbound train on that section of the road, between Macon and Echeconnee, 9 miles, single track, on which the semi-automatic signals, giving right of road from station to station, have all been put under the control of the operator at Terra Cotta, about one mile west of Macon. Time-table rights have been abolished and no written train orders are issued. The signal which was disregarded is temporarily without a distant signal because the arrangement for moving trains wholly by signal is not yet completed west of that point; and for this reason a bulletin had been issued, on March 28, requiring all eastbound trains to approach this signal under control. The engineman at fault claimed to have had his train under control, to the extent that he could have stopped but for the fact that the fireman, who, from the left side of the engine would be the first to see the signal, had wrongfully called the signal as clear. He said that as soon as it was visible from his side of the engine, he saw that it was red and applied the brakes in emergency. The inspector finds, however, that even without leaving his seat, the engineman could have seen the signal at a distance of 1,300 ft. and (it seems) is quite convinced that the speed was higher than is admitted by the engineman. The engineman of the standing freight train thought that No. 12 struck the freight at about 45 miles an hour.

Oklahama City-Ada-Atoka, Konawa, Okla., April 4, 5:22 p.m.—A southbound freight train, having passed Konawa where it should have waited for northbound passenger train No. 16, collided with the passenger train, three miles south of Konawa, and the fireman of the passenger train was killed. Eight passengers and four employees were injured and the baggage car and one freight car were wrecked. The engineman of the freight had completely forgotten train No. 16; and the conductor, riding at the rear of the train, claimed that he intended to go to Tyrola, four miles farther south, and that he had made a mistake in regard to the time of the passenger train (due at Tyrola at 5:01 p.m.) having fixed his mind on train No. 14 which is due there at 5:22 *in the morning*. There are only two northbound passenger trains in the timetable. The conductor claimed also that the necessity of stopping to release some brakes which were sticking was a reason for his forgetting about train No. 16. The flagman of the freight had consulted his timetable and knew that the time of No. 16 was being encroached upon but did not mention the fact to anyone. The inspector does not directly question or discredit the statements of any of the members of the crew, but calls attention to much lax practice regarding the rules. Train registers had not been properly filled out, watches were not regularly compared and men were on active duty without timetables.

Missouri-Kansas-Texas, St. Paul, Kan., April 8, 4:52 a.m.—A northbound passenger train, moving at 40 or 50 miles an hour, was derailed at a washout and the engineman and fireman were killed. A trespasser was also killed and 11 passengers, three employees and two other persons were injured. The report, filling six pages, deals with inquiries made as to the care taken to watch the track, in view of the bad condition of the weather. Eight inches of rain had fallen in 12 hours, but the track foremen had taken no special precaution whatever, although another foreman, near the same place, had noticed in the middle of the night that the rain was unusually heavy. The report says it is inconceivable that the existence of a storm of such severity should fail to cause anyone connected with the railroad to realize the need for special precautions. The existence of high water was known at a point on another division of the road, only a few miles away. The train derailed was, indeed, being detoured by way of St. Paul (over the Nevada division) because of a washout on the Kansas City division; yet no action was taken to examine the roadbed on the Nevada division, but a few miles away. The crew of the detoured train were not very familiar with the road. The report says that this cannot be said to have been the cause of failure to run at restricted speed, but the inspector calls attention to unsatisfactory arrangements by which trainmen whose headquarters are at Parsons run over territory with which they are not thoroughly acquainted.

Colorado & Southern, Uva, Wyo., April 28, 1:18 a.m. —Locomotive No. 645, northward, in charge of Engineman Carter and Fireman Morgan, without train, encroached on the time of southbound passenger train No. 30 south of Uva, and collided with it, badly damaging both locomotives and causing the death of the engineman and the fireman of No. 645, and the engineman of the passenger train; and the injury of 28 passengers, two Pullman porters and two employees. An order which required No. 645 to clear the passenger train at Uva at 1.15 a.m., had been delivered to the light engine at Wheatland, by means of a hoop. The watches of the men who were killed were found to have stopped at different times, but there is no evidence that Carter's watch was not right, and it is impossible to say why the order was disregarded. Moreover, had both Carter and Morgan failed to read the order they would have been required to clear No. 30 at an earlier time.

* Preceding reports of government investigations of train accidents will be found in the *Railway Age* of April 2, 16, 23, June 11 and August 20.

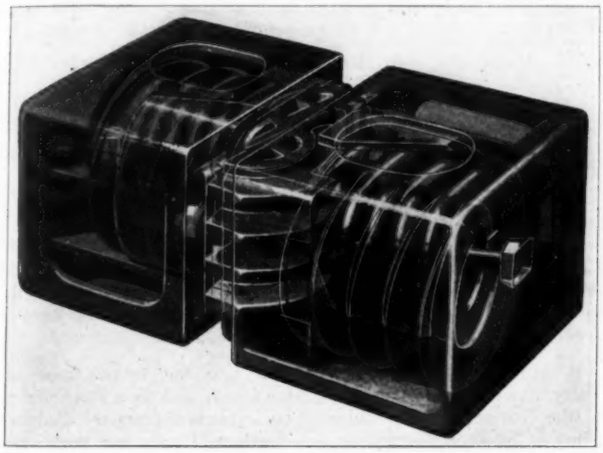


Oil-Electric Tug "Meitowax," Placed in Service in New York Harbor by the Long Island

Forsyth Friction Draft Gear

AFTER a number of years of careful tests and development, the Forsyth Draft Gear Corporation, 39 South La Salle Street, Chicago, has placed on the market a new friction draft gear, designed to have high shock absorbing capacity and recoil sufficient to take care of yard switching and train conditions.

The gear is of sturdy construction, housed in two strong steel castings with a cross sectional area of over 20 sq. in. to take the entire load off the operating parts when the gear has received an over-solid blow, and further prevent the main coil springs from being driven solid. These housing castings also serve the purpose of followers, as the ordinary standard followers used with some gears are not required for this gear.

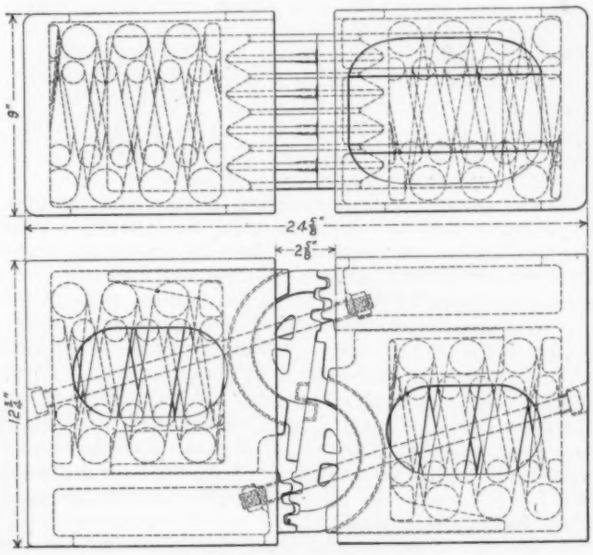


Phantom View of Forsyth Friction Draft Gear

This gear is made to fit the standard American Railway Association draft gear pocket and yoke.

The gear consists of three different castings (two of each), besides the coil springs and tie rods. The springs are standard M. C. B., class "G" springs, set up under initial compression. A total frictional area of 275 sq. in. is provided to assure long life to the wearing parts. The housing castings and levers are made of open hearth cast steel, finished by sand blasting; the spring cap is made of alloy steel, heat treated. Thus all frictional surfaces in contact are of different materials, producing the best combination to eliminate excessive wear.

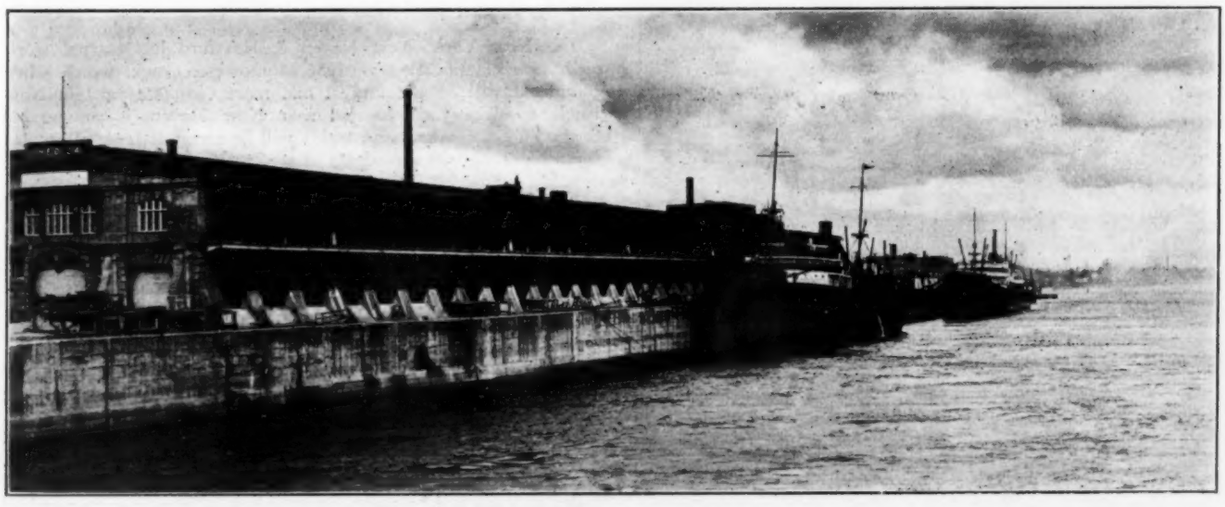
The Forsyth friction draft gear is shown assembled in the drawing. The two tie rods serve to hold the



The Forsyth Draft Gear

gear under initial compression and facilitate the handling of the gear during shipment and applying to the car. The tie rods do not function when the gear is in the draft gear pocket.

The principle used in building up high resistance to service shocks in this gear is by closing the two class "G" coil springs by leverage. The leverage arm shortens during the closing action of the gear, thus producing high resistance to closing of the coil springs. However, the major portion of the capacity of this gear is produced by the vee-shaped groove bearings between the spring cap and center lever. The circular action of the center lever operating in the spring cap produces high resistance; additional friction is also created between the back wall of the spring cap and the inside curved wall of the housing casting.



A Pier Shed in Montreal Harbor

C. M. & St. P. Electric Operation Extended to Seattle

THE Chicago, Milwaukee & St. Paul has extended the electrification of its Cascade Division from Black River Junction, Wash., to Seattle, Wash., a distance of 8½ miles. Electric operation was previously used between Othello, Wash., and Tacoma, Wash., a distance of 220 miles, steam power being used between Black River Junction and Seattle. All trains on the Cascade Division including the Olympian and Columbian as well as the National Park Limited are now hauled by gearless electric locomotives.

Power is supplied from existing sub stations, the only requirement for the extension being the construction of the overhead contact system. The total route miles from Black River to Seattle is 8½ and the total miles of track electrified about 18. The line constructions consists for the most part, of double bracket arrangement by means of which the contact wires on both tracks are supported from a single line pole located half way between. Three types of poles are used; namely, the wood pole as on the main line, a fabricated steel mast of which there are only 4 or 5 and an H-section steel pole. Double contact wires over each track similar to those used on the main line furnish practically all of the feeder section, no auxiliary feeder being used.

With this extension the total electrified line on the C. M. & St. P. includes 665 route miles.

THE AGRICULTURAL DEPARTMENT of the Long Island Railroad which operates an experimental farm at Medford, L. I., is to be abolished. Mrs. Edith Fullerton has been appointed director of the road's agricultural department, succeeding her husband, H. B. Fullerton who has retired under the pension rules of the company. The experimental farm has been offered for sale by the company and as soon as it is disposed of the company will abolish the department which operates it, terminating a service which has long been rendered to farmers of Long Island, the district now becoming more and more a residential section. Mrs. Fullerton will not actually assume the title of director until the first of next month, as it is provided in company regulations that retiring officers shall retain their titles until the month following retirement.

The Great Northern's Greenhouse at Monroe, Wash.

Looking Backward

Fifty Years Ago

Ground was first broken for the Philadelphia & Atlantic City, 55 miles in length, on April 1 and a train was operated over the complete line on July 7.—*Railroad Gazette*, August 24, 1877.

The first bale of cotton to be sent via the new fast freight line recently established by the Missouri, Kansas & Texas and the Chicago, Burlington & Quincy has arrived in Chicago.—*Chicago Railway Review*, August 25, 1877.

An examination of the track of the Erie shows that the rail has been produced by 70 different manufacturers, that 115 different patterns of chairs have been used and that there are 70 separate types of fish-plates.—*Railroad Gazette*, August 24, 1877.

Twenty-Five Years Ago

President Roosevelt has accepted the invitation of the Brotherhood of Locomotive Firemen to attend their biennial session at Chattanooga, Tenn., on September 8.—*Railway and Engineering Review*, August 30, 1902.

A majority of the outstanding common stock of the Cleveland, Cincinnati, Chicago & St. Louis is now held in the treasury of the Lake Shore & Michigan Southern, although it is still operated as an independent organization, according to the annual report.—*Railroad Gazette*, August 29, 1902.

A little humor has been injected into the serious case of Peter Power, young law clerk, who a year ago as a stockholder of the Northern Pacific obtained an injunction from the Federal court at St. Paul restraining the Northern Pacific and the Great Northern from turning over their stocks to the Northern Securities Company. After several weeks of evasion of a police summons Power is now resting in jail for contempt of court. Power and his lawyer, Lamb, evince a decided intention to hang on to the $15,000 worth of N. P. stock which Broker Weidenfeld furnished Power to enable him to serve in court as a dummy stockholder and there is every indication that the entire case will be thrown out of court.—*Railway Age*, August 29, 1902.

Ten Years Ago

The Pere Marquette and the Baltimore & Ohio have followed the Pennsylvania in adopting the plan of "sailing days" for freight cars handling less than car-load shipments.—*Railway Review*, August 25, 1917.

The New York, New Haven & Hartford has started work on a new classification yard at Montowese, Conn., which when completed will be the largest and most complete yard in New England. The yard, located near New Haven, is comparable to the hub of a wheel and trains will be received from all routes for all destinations.—*Railway Age Gazette*, August 24, 1917.

Robert S. Lovett, chairman of the executive committee of the Union Pacific, has been designated by President Wilson as administrative officer under the provisions of the priority of shipments law, which authorizes the President, during the war, to direct that shipments essential to the national defense shall have preference in transportation by any common carrier.—*Railway Age Gazette*, August 24, 1917.

An indication of what may be expected of American Railway construction regiments in France is given in a report of the work done by Canadian railway troops for the month of April. During that time 1,597 enlisted men laid 51 miles of broad gage track and 2,504 men laid 73 miles of narrow gage track. On broad gage lines 686 men were engaged in maintaining 61 miles of track and on narrow gage track 1,258 men were required to maintain 100 miles.—*Railway Review*, August 25, 1917.

Communications and Books

A Dispatcher's Viewpoint on Track Motor Car Operation

CHADRON, Neb.

TO THE EDITOR:

Your editorial, "Dispatcher's Responsibility for Track Motor Cars," in the July 30 issue, presents only one side of the question and the dispatcher is convicted on *ex-parte* evidence.

I am of the opinion that a line-up indicating train movements, given to a maintenance foreman, is a hazardous thing. Such a line-up may cover the situation at that particular time and be absolutely worthless 20 or 30 minutes afterwards, for the reason that meeting points may be changed, trains become unexpectedly delayed, or any number of other emergencies may occur to change the entire movement of trains.

Train movements can only be directed properly by a dispatcher in the form of prescribed train orders and it would be impossible for a dispatcher to handle track motor cars in this manner and assure them the same protection. Line-ups have a tendency toward making the men who receive them careless as to their own responsibility. They rely too much on the line-up and not enough on their own judgment. Ordinarily, a line-up is not an authority for the movement of motor cars, nor does it assure them protection unless it is issued in the prescribed train order form.

A safer method is for the foreman to obtain his information verbally from the dispatcher. This information would be first hand and accurate and should include comments from the dispatcher as to how the trains were running and what might be expected from one station to another. It should be required that this information be obtained at frequent intervals, so as to keep the foreman advised of sudden changes in train movements. This would confer no right to the track motor car for movement except under its own protection.

The dispatcher is burdened sufficiently with responsibilities without adding the supervision of track motor car movements.

H. S. SMITH,
Chief Train Dispatcher, Chicago & North Western.

Safe Operation of Track Cars

SAN LUIS OBISPO, Cal.

TO THE EDITOR:

In placing the responsibility for accidents to track motor cars, we should be careful and place it where it belongs. No doubt most such accidents occur on single track, where trains may be expected from either direction at any time.

If a man—section foreman, signal maintainer, or any one in charge of a motor car—requests from the train dispatcher a so-called "line-up" and it is given him from the information that the dispatcher then has at hand of such trains that may then be on the road, or expected to be during the hours the motor car will be using the main track, that is all that could be expected of him. The "line-up" may state that certain scheduled trains are then so much late and others on time; that an extra west had left B at 9:30 a.m., that another had left C at 9:45 a.m., and an extra east had left D at 10:05 a.m. This being all the trains that were known, or expected, to be on the road. He should add that other extra trains could be expected at any time. This, of course, would nullify the "line-up" to a great extent, but it is necessary for self-protection against coroners' juries and others.

The dispatcher, owing to a derailment or engine failure may find it necessary to take an engine from a train of lesser importance and run it to the point of trouble, after the "line-up" has been given and the motor car out of reach. Would the management approve of holding an engine in such case, or instructing it to protect against the track motor car?

If track motor car accidents are thoroughly investigated it may be found that they were being operated at a higher rate of speed than the rules permit. When we have cars that will make a speed of 40 miles an hour and they are operated at a high rate of speed in obscure places, then is when the unexpected occurs and the "accident" happens. In such a case the man in charge of the motor car should be held responsible.

When we wish to hold the train dispatcher responsible, these cars should be operated under time-table and train-order authority. This, of course, would increase the number of train orders to such an extent that its effect on the movement of steam trains would have to be seriously considered. Furthermore, in such case these men would have to be examined on rules and train orders the same as trainmen and enginemen. If this is done then we can hold the train dispatcher responsible for any errors on his part; and the man in charge of the track car would be responsible wherein he failed.

If we are really honest in our desire to safeguard these movements of track cars, let us remove the insulation from the wheels, so that block signals may function properly when a motor car is in the block; and require these men to live up to rules governing the handling of such cars.

Until some such measures are taken, we should not insinuate that train dispatchers are responsible for the loss of lives caused by those who do not live up to trackmen's rules and those who do not look out for themselves in dangerous places.

WM. NICHOLS.

C. N. R. Recognizes the Automobile

WINNIPEG, Man.

TO THE EDITOR:

The writer is in full accord with the thought expressed in the editorial: "The Passenger Station and the Automobile" which appeared in the *Railway Age* of July 30. The railroads must reckon with the automobile. The Canadian National, in keeping with its policy of "Courtesy and Service," has recognized the automobiles and made a place for them. The largest parking

Parking Space Provided at the Union Station at Winnipeg

ground of its kind in Winnipeg has been provided by the Canadian National for the use of its patrons. Now holiday makers, going down to Grand or Victoria Beach on Lake Winnipeg for the day or going to Minaki for the week-end, may drive up with their cars, park them while they go off to enjoy themselves and step off the train on their return home to find no need for taxis or street cars.

The number of motor cars is still growing in Winnipeg and the Canadian National system is one of the first business organi-

zations to provide such a convenience for its patrons. Located on Main street at the north end of the Union station, which lies at the foot of Broadway, the parking ground is 200 ft. long by 40 ft. wide and has accommodation for 110 cars. A strip of lawn grass 10 ft. wide divides the park into two driveways, thus giving it a horseshoe shape. The fact that it is a one-way drive makes for the elimination of confusion. The entrance way is 38 ft. wide. The surface of the park is of crushed rock and the whole area is well drained. It is illuminated by two powerful electric searchlights. An iron fence will shortly surround it.

R. H. AYRE,
Assistant Publicity Representative, C. N. Rys.

New Books

Electrification of Sydney and Suburban Railways, a series of papers presented before the Institution of Engineers of Australia. Published by the Institution, Sydney, 1927. *382 pages, illustrated, 5¾ by 8¾. Bound in cloth.*

The book shows the development of the electrification of Sydney and suburban railways through a series of papers presented before the Institution of Engineers. These papers cover the important characteristics of the railways, introduced by an historical sketch. Track and construction work is considered and the signaling system is described in detail. The bulk of the book, however, is devoted to such subjects as electric rolling stock equipment, maintenance shops, inspection depots, power supply and distribution. Numerous curves, charts, tables and photographs are included. All of the information is presented in detail.

Railway Accounting Procedure, 1928 Edition; 1016 pages; 460 illustrations; bound in fabrikoid; 6 in. by 9 in. Edited by E. R. Woodson. Published by Railway Accounting Officers Association, 1116 Woodward Building, Washington, D. C. Price $3.00.

Railway Accounting Procedure appears in its 1928 edition with 1016 pages as against the 863 pages in the 1927 edition. The additional pages embody such activity of the Railway Accounting Officers Association reported at the annual meeting at Denver in June of the present year as has resulted in the addition of new recommendations or plans of carrying on the work of the railway accounting department. Included, notably, is the comprehensive plan for material accounting, pages 532 to 580, which was the result of years of effort on the part of the R. A. O. A. Committee on Disbursements Accounting. This plan is sufficiently comprehensive to include more than 70 new standard forms. In addition, there is also included in the 1928 edition for the first time, an interesting treatise entitled "An Outline of the Railway Accounting Officers Association," by Charles E. Parks, director, Department of Railway Station Management, LaSalle Extension University, Chicago. It appears as the first 20 pages of the volume.

The bibliography of accounting articles which first appeared in the 1925 edition, has been brought up to date by the inclusion of the articles on railway accounting and statistics which appeared in 1926 and in 1927 to the middle of June. In addition, a new section has been added to the bibliography, giving references to the articles appearing (since 1920) on accounting for motor transport.

Railway Accounting Procedure is the standard text book on railway accounting practice. It is published annually as soon after the annual meeting as convenient and proves indispensable to the railroad accountant because it serves as a manual and as such gives the latest complete information regarding the details of railway accounting work. The book does not purpose to be, however, a manual on the science of railway accounting, there being at the present time no up-to-date book on that particular subject outside of the Interstate Commerce Commission accounting classifications. The book is made up into a number of important sections, as follows: Freight, Passenger, Disbursement, Overcharge, Statistics, and Terminal, each section being subdivided into the mandatory rules, recommendatory rules, plans and methods, and followed by reproductions of the R. A. O. A. standard forms.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Commerce Yearbook 1926. *Vol. I.—United States,* compiled by U. S. Bureau of Foreign and Domestic Commerce. General survey and detailed statistics on production, employment, and commerce. The section "Transportation and Communication," on pages 578-635, reviewing developments in rail, motor, waterway, and air transportation and telephone, telegraph and cable communication, is reprinted as Trade Information Bulletin No. 501, price 10 cents. The yearbook is indexed. 676 p. Pub. by U. S. Govt. Print. Off., Washington, D. C., $1.

Industrial Group Insurance, by National Industrial Traffic Board. A study of experiences of various organizations with group insurance, including six railroads. 44 p. Pub. by National Industrial Conference Board, Inc., New York City. 75 cents.

Origin and Distribution of the Commercial Potato Crop, by J. W. Strowbridge. Accompanied by maps and charts, this study presents the distribution of the crops from 17 producing areas by carloads for specified periods. 60 p. Pub. by the United States Government Printing Office, Washington, D. C., 15 cents.

Railway Accounting Procedure 1928 *Edition,* edited by E. R. Woodson. Includes the mandatory and recommendatory rules for freight, passenger, disbursements and terminal accounting, an outline of the work of the association, overcharge and agency relief claim rules, and continuation of the bibliography in the 1926 and 1927 editions which this time lists 1926 and 1927 material on railway accounting history, depreciation, railroad statistics, and a new part on motor transport accounting. 1016 p. Pub. by Railway Accounting Officers Association, Washington, D. C., $3.

Periodical Articles

America Takes to the Air, by Frank Parker Stockbridge. Particularly interesting for the map of existing and proposed air lines by types of lines, p. 10-11. 10-11. Popular Science Monthly, September, 1927, p. 9-11.

Antitelescoping Brackets on Victorian Railway Dining Cars, by Elmer G. Pauly. Diagrams of brackets on p. 468. Commerce Reports, August 22, 1927, p. 467-468.

Comparative Wage Rates in the United States and in Foreign Countries. Wage tables by occupation assembled from material published in recent numbers of the Review. "No attempt is made to show rates in the various countries for the same date or for the same unit of time, as the necessary information is not available." p. 110. "Railroads" p. 124-125. Monthly Labor Review, August, 1927, p. 110-131.

An International Research Service. Editorial comment on "the chief problem" of the 3d General Conference on Communications and Transit meeting this month in Geneva—that of building up a service of information in regard to international transportation questions. Modern Transport, August 13, 1927, p. 1.

EMPLOYEES OF THE GENERAL ELECTRIC COMPANY who have been in the service of the company for five years or more have just received bonuses for the first half of 1927 amounting to five per cent of their earnings during that time; total number of employees, in factories and offices, 31,436; total "supplementary compensation" $1,403,723.

Odds and Ends of Railroading

J. W. Binkley, veteran engineman of the "Meteor" on the St. Louis-San Francisco, is a collector of steer horns. He is the proud possessor of a settee made of 26 steer horns, including what is said to be the largest set in the world. This set of horns measures 7 ft. 9 in. from tip to tip. The footstool for the settee is made entirely of black horns.

Reference has been made in this column to railroad maps—not all of it complimentary. On this subject a constructive and informative brochure has just been issued by the Matthews-Northrup Works, Buffalo, N. Y. There is a brief history of map-making and a short description of the various methods employed, with a more detailed account of the wax-engraving process.

Miss Elizabeth Cullen, reference librarian of the Bureau of Railway Economics, has called this department's attention to a railroad man who is rapidly becoming a successful fiction writer. He is Leo Creagan, a Union Pacific train dispatcher. Stories by him on railroad subjects have appeared in his own company's magazine, the Canadian National Railways Magazine, Sunset, McLean's and Popular Science Monthly.

Crutch Mystery Baffles Sleuths

The mystery of who left his crutches on the train, referred to in this department in the issue of July 23, has never been solved, writes J. R. Mecouch, editor of the Mutual Magazine (P.R.R.). An even stranger object picked up and turned over to the lost and found department, he says, was an artificial leg. This kept the employees guessing for several days until it developed that it had been entrusted by its wearer to a friend to take to Philadelphia for repairs, and it was he who had left it on the train.

But Mr. Destcott Has a Theory

"In your issue of July 23 I note a paragraph referring to articles left on trains. In this connection you commented particularly on the finding of a pair of crutches, but stated that you were not advised what the circumstances were leading to these crutches being left on the train. If the situation on the Pennsylvania is similar to that which exists on some territories in the Southwest, it might not be so difficult to explain the leaving of the crutches on the train. Just as a guess, I would suggest that the owner of the crutches, while en route to the trial of his damage suit against the railroad for professed injuries, received a wire from his lawyer advising that his case had been settled out of court. Having therefore no further use for the crutches he preferred to leave them on the train rather than to be burdened with them on his way home."

G. R. Westcott,
Assistant Engineer, Missouri Pacific.

Extra—One Hundred Million Lives Lost!

An unusual damage claim has just been filed against the Chicago, Rock Island & Pacific, by an apiarist, seeking recovery for the death of 104,250,000 bees. According to the bee-fancier, rain leaked through the roof of the car in which the bees were being shipped and drowned all the bees in 267 of the 590 hives. In 130 of the swarms, 75 per cent were killed. The 43,250,000 bees that survived were alleged to have been rendered so weak from exposure that they had to be fed with two tons of damp sugar to bolster their faltering spirits. The snuffing out of over a hundred million lives in one fell swoop is probably a record slaughter.

More Railroad Portias

In response to the challenge of the Baltimore & Ohio to any other road to produce a feminine local attorney, the St. Louis-San Francisco comes forth with not only one, but two of them! One is Miss Virginia Booth of Pacific, Mo., the other Miss Verna Whitesell, of Shawnee, Okla., Miss Booth having been appointed in 1925 and Miss Whitesell in 1926.

The "General" Takes to the Road

The "General," the famous locomotive which figured so prominently in the Andrews raid during the Civil War, has taken to the road again. The historic engine, which has been on exhibition in the train shed of the Nashville, Chattanooga & St. Louis station at Chattanooga for years, was shipped on a specially constructed car to Baltimore, Md., where it will be a feature of the B. & O. centennial. During the Civil War, the "General" was stolen from its crew at a little station near Marietta, Ga., by Colonel Andrews and his federal raiders. The crew gave chase in a handcar and finally obtained the "Texas," another locomotive, in which the pursuit was continued. The "General" was overhauled after several thrilling episodes and Colonel Andrews and his men, who fled to the woods, were captured and hanged.

The High Cost of Experience

Nine little railroad men handling freight,
One stepped on a rusty nail—that left eight.
Eight little railroad men surfacing track eleven,
One didn't hear the bell and then there were seven.
Seven little railroad men with a lot of cars to fix,
One failed to post blue flags and then there were six.
Six little railroad men, all spry and live,
One rode an engine pilot and then there were five.
Five little railroad men all warned before,
One went between moving cars, then there were four.
Four little railroad men with good eyes to see,
One didn't wear his goggles and then there were three.
Three little railroad men on train overdue,
One left a switch open and then there were two.
Two little railroad men on a switch run,
One left a car foul and now there's only one.
Said one little railroad man left all alone,
"Now, while my skin is whole and my life's my own,
I'll take your safety dope, I'll take it straight,
Before I go the way of the other eight."

He Likes His Whistle "Sweet and Low, Prolonged Pianissimo"

The following unusual letter was sent by a farmer living near Drakesville, Iowa, to a locomotive engineman on the Chicago, Rock Island & Pacific. W. E. Babb, editor of the Rock Island Magazine, passed it along to this department.

"Please pardon a stranger for butting in, but I heard you approaching Drakesville today and the way you handled the whistle made me sit up and take notice. I note it is an unusually flexible whistle, permitting many different shades of tone. It is certainly responsive to the touch of a master hand, such as it had this morning.

"It seems to me that most engineers don't pay much attention to the music of their whistles. A few of the whistles I hear are not very pretty, but most of the chime whistles are, and I am very glad to note that lately the new locomotives are being fitted with the pretty chime whistles.

"I suspect that only a small percentage of people along the track even know that there can be music in a locomotive whistle at all. I suppose most folks hear just noise. So an engineer who really delights in making music probably doesn't have much of an audience. Well, I wanted you to know that one bald-headed cuss here at Drakesville is appreciative and I hope you will remember this fact on your future trips and do your durndest. So, when you have an engine whose whistle valve permits the production of pretty tones and shades of tones, please play them all for me, and wind them up with a sweet and low, prolonged pianissimo tone."

NEWS of the WEEK

D. & R. G. W. Shops, Grand Junction, Colo.

THE CHICAGO, ROCK ISLAND & PACIFIC will hold its annual athletic tournament at Topeka, Kan., on August 27.

THE American Railway Magazine Editors' Association will hold its annual meeting at New Orleans, La., on October 28 and 29.

WILLIAM A. TIRRELL, formerly an examiner for the Interstate Commerce Commission, has been appointed clerk and accountant of the New Hampshire State Public Service Commission.

CONFERENCES between representatives of the Brotherhood of Locomotive Engineers and a committee representing the southeastern railroads on the wage demands of the brotherhood were begun in Washington on August 16.

T. E. PRATT, Chairman of the Protective Section, A. R. A., reports that, from data gathered by this Section, the value of freight stolen during the first three months of this year, as reported by Class 1 Rail roads, is shown to have been 17 per cent less than in the corresponding period of 1926; total reported in the three months of 1927, $284,215; total, 1926, $342,499. For the three months the total of all payments on claims for loss and damage of freight increased 4.7 per cent, while the total for unlocated loss (not including live stock, coal, grain and oil) decreased 8.8 per cent.

Annual Meeting of Telegraph & Telephone Section

The Telegraph & Telephone section of the American Railway Association will hold its annual meeting at the Willard Hotel, Washington, D. C., on October 4-6. Aside from the regular committee reports and the election of officers the principal items in the program are the following papers: P. J. Howe, (W. U.) on permanent inorganic wood preservatives; J. C. Rankine (G. N.) on telegraph traffic methods and organization on railroads; Dr. H. C. Frankenfield (U. S. Weather Bureau) on the weather as a factor in the operation of railroads and wire communication.

Reports are expected from the six subcommittees on outdoor construction and maintenance; four sub-committees on indoor construction and maintenance, and from committees 3, 4, 5, 6, 7, 10, 11, 12 and 13.

Master Blacksmiths Elect New Officers

At the recent convention of the International Railroad Master Blacksmiths' Association which was held at the Hotel Lafayette, Buffalo, N. Y., August 16-18, the following officers were elected: President, W. H. Shackford, Atlantic Coast Line; first vice-president, John J. Haggerty, New York Central; second vice-president, J. P. Reid, Missouri Pacific, and secretary-treasurer, Wm. J. Mayer, Michigan Central. Harry D. Wright of the Pere Marquette was appointed chairman of the executive committee.

Passenger Train Wrecked by Oil Fire; Four Killed

At Himes, O., on the Baltimore & Ohio, on the afternoon of August 13, a southbound passenger train, which ran into a truck loaded with oil and gasoline, at a highway crossing, was set afire, and four persons were burned to death; the engineman, the fireman, a messenger on the train and the driver of the truck. The crushing of the oil tank caused flaming fluid to spread over the locomotive and the first three cars; and these cars, one of them containing a passenger compartment, were burned up. The train ran nearly half a mile after the crash.

Management Association Advisory Committee

The American Management Association has appointed an advisory board of 40 members to assist it in its investigations into problems of management methods. On this board are several representatives of railroads and railway supply manufacturers. Among them are: Elisha Lee, vice-president, Pennsylvania; Edgar S. Bloom, president, Western Electric Company; E. M. Herr, president, Westinghouse Electric & Manufacturing Company; B. L. Worden, president, Cutler-Hammer Manufacturing Company; Charles R. Hook, vice-president and general manager, American Rolling Mill Company; M. R. Leeds, president, Leeds & Northrup Company; and F. A. Scott, president, the Warner & Swasey Company.

Railway Fuel Statistics for June

Class I railroads in June expended $23,352,297 for fuel for road locomotives in freight and passenger train service, according to the Interstate Commerce Commission's monthly summary of railroad fuel statistics. The average cost of coal was $2.63 per net ton, as compared with $2.60 for the corresponding month of last year, and the average cost of fuel oil was 2.79 per gallon, as compared with 2.92 cents. For the six months ended with June the railroads used 48,571,648 net tons of coal, as compared with 49,954,812 in the first six months of last year, and 998,385,529 gallons of fuel oil, as compared with 989,617,271 last year. The total expenditure for coal and oil was $158,681,159 for the six months' period, as compared with $159,842,849 in the corresponding period of 1926.

Two-Day Meeting of Southwest Car Men

About 200 members of the Southwest Master Car Builders' and Supervisors' Association met at Galveston, Texas, August 12 and 13, and in a two-day session gave consideration to the problems confronting car men in that region. The meeting was called to order by President A. C. Wilson, general car inspector of the Missouri Pacific, and addresses were made by W. G. Choate, general manager of the Missouri Pacific, and R. H. Innes, inspector, Bureau of Explosives. Committee reports on hot-boxes, transferring of cars, lighting passenger equipment, light freight car repairs and standard practice in cleaning passenger cars were discussed. The following individual papers were presented: Prevention of slid flat wheels, by J. P. Stewart, general supervisor of air brakes, Missouri Pacific; Interchange of cars, by C. J. Nelson, chief interchange inspector,

Chicago, and Progressive system of repairing freight cars, by M. V. Dietz, general car foreman, Gulf Coast Lines.

International Conference on Communications and Transit

The Department of State has announced that the government of the United States had accepted an invitation of the League of Nations to participate in the Third General Conference on Communications and Transit which convened at Geneva, Switzerland, on August 22, to consider a plan for the collection and exchange of information in regard to communications and transit. Hugh R. Wilson, minister to Switzerland, was to represent the United States at the conference by Chauncey G. Parker, counsel for the United States Shipping Board, and Norman F. Titus, chief of the Transportation Division of the Department of Commerce, and William H. Bonneville, attorney for the Interstate Commerce Commission, were to serve as technical advisers.

Further Hearings on Need for Cab Curtains

The Interstate Commerce Commission has assigned for further hearing at Detroit on September 7 and Albany on September 14 the complaint filed by the Railroad Commission of Wisconsin asking the commission to require railroads to equip their locomotives and tenders used in Wisconsin and other states subject to similar climatic conditions with cab curtains or other devices to protect employees from inclement weather. The hearings will be before Special Examiner Rogers.

At the recent hearing at Madison, Wis., an agreement was reached that carriers using locomotives in the territory south of the southerly line of Virginia, Kentucky, Missouri, Kansas, Colorado, Utah, Nevada and a line running southwesterly from Carson City to San Francisco may be considered as not being involved in the case. Further hearings are to be held at a point in South Dakota and a point in Montana. The Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen & Enginemen intervened in the case and have participated in the proceedings.

Wabash Clerks' Pay Raised

The clerks of the Wabash have been granted increases in wages, averaging $7.40 a month, by the arbitration board which has been considering their demands. The increases take effect as from August 16 and affect about 3,500 individuals.

All clerks are advanced 3½ cents an hour; station employees including baggage-room workers, callers, watchman, janitors, etc., 2 cents an hour; messengers, chore boys and those assorting way bills (not requiring clerical skill), 2 cents an hour. Certain freight handlers were awarded an increase of 2½ cents an hour, and other freight men, such as sealers, scalers and fruit inspectors will be paid 3 cents an hour above the wages of truckers; stowers, stevedores, callers, etc. 4 cents an hour, above truckers' rates. Employees without previous clerical experience who are entering the service to fill positions of clerk or machine operator will be paid $2.35 a day for the first six months; $3.19¼ for the second six months and thereafter the established rate for the position occupied.

The awards will increase the payrolls about $300,000 a year.

Production of Consumer-Owned Coal Mines

According to a special study recently completed by the Bureau of Mines, 22.1 per cent of the total bituminous coal output in 1924 was produced by mines owned by, or affiliated with consuming interests. There were 647 mines of this class in operation during the year and the tonnage accounted for by these mines amounted to 107,039,855 net tons. Slightly more than 90 per cent of this tonnage was used by the consumer owner while the balance, 10,536,993 tons, was disposed of either by local sales or in the open market in competition with commercial coal.

The output of mines owned by or affiliated with railroad companies amounted to over 31 per cent of the consumer-owned tonnage. The total production of railroad mines is given as 33,641,225 tons for the year 1924, of which 392,643 tons was made into coke at mines; 394,082 tons was sold to local trade, including that sold to employees, delivered to locomotives at tipple or used in plant at mine; and 640,276 tons was used as mine fuel.

Fuels Division A.S.M.E. to Hold Its First National Meeting

The Fuels Division of the American Society of Mechanical Engineers will hold its first national meeting at St. Louis, Mo., October 10 to 13, inclusive. A total of 26 papers, divided into four general classifications—namely, general industrial, power plant, and smoke abatement—will be presented during the four-day meeting. The following is a list of subjects of interest to railroad men on which papers will be presented:

Address on Fuels, by S. W. Parr, professor of applied chemistry, University of Illinois, Urbana, Ill.

American Fuel Resources, by O. P. Hood, chief mechanical engineer, U. S. Bureau of Mines, Wash.

The Clinkering of Coal Ash, by A. C. Fieldner, chief engineer of experiment stations, U. S. Bureau of Mines, Pittsburgh, Pa.

Factors Governing the Purchase of Fuels, by Morgan B. Smith, engineer, General Motors Corporation, Detroit, Mich.

Application of Powdered Fuel to Smaller Boiler and Industrial Installations, by H. W. Brooks, consulting engineer, Erie City Iron Works, Erie, Pa.

The Burning of Liquid Fuels, by Ernest H. Peabody, president, Peabody Engineering Corporation, New York.

The Relative Values of Gaseous Liquid and Solid Fuels, by F. C. Binnall, assistant manager, Standard Sanitary Manufacturing Company, New Brighton, Pa., formerly chemical engineer, General Oil and Gas Corporation.

Characteristics of Modern Boilers, by E. R. Fish, vice-president, Heine Boiler Company, St. Louis, Mo.

The Measurement of Atmospheric Smoke Pollution, Visible and Invisible, by Dr. Geo. T. Moore, director, Missouri Botanical Garden, St. Louis, Mo.

Smoke Abatement Methods Used in Cleveland, by Col. Elliott H. Whitlock, commissioner of smoke inspection, Cleveland, O.

Managing a Smoke Abatement Campaign, by Earle Ormsby, president, Citizens' Smoke Abatement League, St. Louis, Mo.

Highway Crossing Signals in Pennsylvania

The Public Service Commission of Pennsylvania announces that, following an agreement with the Department of Highways, the establishment of automatic electric signals at certain highway grade crossings of railroads and highways, is to be standardized. The new regulation, to which the railroads are expected to assent, applies only on State highways. Whether to all on these highways, or less than all, is not stated.

The railroad company is to erect a signal on each side of the railroad, erect a signal on each side of the railroad, the signal to present to the highway traveler the appearance of a horizontally moving red light and to conform to the standards of the Signal Section, A. R. A. The railroad is to install and maintain the signals and the department of highways will pay one-half the cost of installation.

Where the signal cannot be seen for 500 ft. there shall be an approach signal, a continuously flashing yellow light set some distance back; this to be erected and maintained by the state but the railroad must pay one-half the cost of installation.

Where the grades of a highway and a railroad have been separated and where, consequently, there is a dangerous curve in the highway, the yellow flashing light must be installed, the railroad to pay one-half the cost of installation.

The department of highways is to forbid the erection of any other horizontally flashing red lights on the state highways.

The state proposes to extend the use of the standard disk approach sign, not only on state highways but on town highways, the disk to be installed by the railroad and maintained by the local authorities. The commission's notice stipulates that the new rule is not to abate or diminish the duty of railroads to change protection measures when necessary.

Freight Claim Prevention Meetings to Be Attended by Operating Officers

The problem of lost and damaged freight will be considered by Eastern and Southeastern railroads and steamship lines at a meeting to be held at the Cavalier Hotel, Virginia Beach, Va., on September 8, at which representatives of 85 railroads are expected to be present. The meeting will last for but one day and will climax a three-day series of conferences of railroad claim officers. There will be an attempt to interest railroad superintendents in measures to correct the principal causes for damage or loss and one superintendent from each railroad in Eastern and Southeastern territory will be invited to participate in the discussion of two subjects—"Carload Damage" and "Lost Freight."

The series of meetings, of which this joint conference will be the climax, will begin on September 5, when the 12 members of the Claim Prevention Committee of the Freight Claim Division of the American Railway Association will hold a two-day discussion of claim prevention

(*Continued on page* 396)

Freight Operating Statistics of Large Steam Roads—Selected Items for June, 1927,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, Excluding locomotive and tender	Ton-miles (thousands): Net, Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1927	407	199,431	214,469	24,462	5,120	64.6	269,148	97,944	106	18	14.2	6
	1926	407	231,810	247,039	25,935	5,225	66.2	271,370	101,769	125	18	12.4	16
Boston & Maine	1927	2,075	486,702	556,184	50,834	12,185	69.1	628,327	250,767	283	66	18.9	34
	1926	2,143	463,276	538,641	51,029	12,484	70.2	627,476	254,332	330	91	21.6	58
N. Y., New H. & Hartf.	1927	2,139	586,141	629,303	39,791	16,370	66.9	865,108	350,928	325	66	16.8	40
	1926	2,163	566,950	597,146	39,502	15,972	66.9	840,938	348,242	317	51	13.9	26
Great Lakes Region:													
Delaware & Hudson	1927	875	344,994	462,658	53,680	10,045	63.2	636,973	309,238	246	37	13.1	83
	1926	875	382,516	518,501	54,322	10,929	64.2	691,888	338,185	243	41	14.5	69
Del., Lack. & Western	1927	999	567,454	648,378	80,471	18,099	66.5	1,038,942	446,304	271	50	15.5	19
	1926	999	583,217	680,292	86,236	18,418	67.7	1,066,693	480,104	266	52	16.3	19
Erie (inc. Chic. & Erie)	1927	2,317	892,370	987,909	91,715	34,736	64.1	2,071,400	878,521	434	173	28.6	46
	1926	2,323	908,867	1,002,381	112,913	34,406	64.9	2,061,112	890,713	550	126	18.6	125
Lehigh Valley	1927	1,346	555,802	604,709	69,126	17,008	64.2	1,012,829	443,663	363	88	19.5	56
	1926	1,345	616,209	78,025	75,411	19,110	63.4	1,165,782	528,750	387	89	18.7	53
Michigan Central	1927	1,820	556,736	568,693	20,065	18,548	61.0	1,040,818	374,995	236	62	20.8	60
	1926	1,835	584,662	599,529	20,847	19,397	61.3	1,073,492	379,143	265	50	15.9	78
New York Central	1927	6,478	1,911,600	2,146,386	147,712	74,878	62.9	4,565,016	1,977,974	1,149	257	18.3	363
	1926	6,482	2,001,393	2,254,225	148,843	76,097	63.5	4,567,052	1,993,143	1,199	307	20.4	366
New York, Chic. & St. L.	1927	1,665	580,572	588,407	6,736	19,830	64.5	1,087,522	402,507	231	50	17.8	49
	1926	1,665	610,923	618,240	6,436	19,211	63.7	1,069,878	406,669	232	59	20.3	49
Pere Marquette	1927	2,180	428,562	435,806	6,087	10,855	62.4	631,338	259,194	182	37	16.9	11
	1926	2,179	415,257	421,701	6,086	10,086	64.4	572,761	237,933	190	23	10.9	26
Pitts. & Lake Erie	1927	231	117,909	119,421	1,403	4,762	63.3	381,033	223,264	57	19	25.0	13
	1926	231	128,865	132,112	1,582	4,556	63.9	353,286	203,750	57	24	29.6	12
Wabash	1927	2,497	666,534	694,230	11,027	20,100	65.1	1,108,118	408,129	327	52	13.7	71
	1926	2,497	686,319	712,172	10,371	20,849	65.4	1,171,113	459,488	319	65	17.0	62
Central Eastern Region:													
Baltimore & Ohio	1927	5,540	2,030,092	2,382,264	200,173	59,380	61.0	4,013,301	1,928,874	1,039	235	18.4	104
	1926	5,519	2,003,371	2,316,244	185,031	58,091	61.8	3,825,714	1,831,284	1,070	207	16.2	166
Central of New Jersey	1927	691	267,770	296,513	31,163	7,745	57.6	520,451	244,454	185	35	15.7	19
	1926	691	269,258	292,350	42,544	7,912	58.0	530,884	253,369	228	38	14.2	55
Chicago & Eastern Ill	1927	945	256,365	262,748	3,575	6,688	63.3	400,313	177,031	125	46	26.8	47
	1926	945	231,353	231,782	3,521	6,426	63.7	372,066	165,847	128	37	22.4	49
Clev., Cin., Chic. & St. L.	1927	2,374	744,575	774,548	19,208	23,150	59.6	1,503,491	668,074	342	93	21.3	36
	1926	2,374	744,075	782,504	25,594	23,868	61.2	1,553,635	721,299	332	99	22.9	38
Elgin, Joliet & Eastern	1927	461	124,188	130,076	4,823	3,489	64.0	264,097	136,960	78	13	14.2	2
	1926	460	122,994	129,457	5,117	3,720	64.9	279,241	166,457	77	15	16.5	4
Long Island	1927	393	47,179	51,074	14,252	609	52.5	42,122	16,465	50	14	22.2	...
	1926	393	47,768	52,452	15,210	615	53.9	41,081	16,171	47	12	19.8	...
Pennsylvania System	1927	10,843	4,436,780	4,897,767	381,859	139,529	63.8	9,064,866	4,176,630	2,876	460	13.8	619
	1926	10,880	4,707,645	5,103,330	372,848	139,121	63.3	9,124,093	4,251,242	2,661	592	18.2	369
Reading	1927	1,130	595,197	645,183	63,550	15,547	58.9	1,094,468	537,056	321	70	17.8	50
	1926	1,131	616,863	673,835	65,150	16,592	60.4	1,136,552	571,747	369	64	14.9	75
Pocahontas Region:													
Chesapeake & Ohio	1927	2,650	1,162,087	1,249,368	47,836	40,147	57.2	3,179,949	1,721,019	540	93	14.6	41
	1926	2,650	1,190,067	1,255,139	40,064	39,278	56.2	3,215,353	1,750,542	556	93	14.3	62
Norfolk & Western	1927	2,232	883,511	1,066,815	34,873	31,498	59.0	2,608,610	1,390,282	556	54	8.8	131
	1926	2,231	919,305	1,111,711	42,669	32,904	59.7	2,701,457	1,476,218	600	52	8.0	166
Southern Region:													
Atlantic Coast Line	1927	5,081	717,353	722,645	11,216	19,235	62.1	1,071,342	412,414	427	58	11.9	99
	1926	4,931	858,038	880,932	14,806	22,701	61.9	1,294,552	513,489	443	52	10.5	74
Central of Georgia	1927	1,898	327,797	330,097	7,350	7,465	67.8	405,905	161,605	148	19	11.5	5
	1926	1,907	381,866	384,917	8,368	8,351	67.8	483,488	221,204	153	22	12.7	3
I. C. (inc. Y. & M. V.)	1927	6,555	2,073,682	2,087,235	50,180	55,571	60.3	3,649,632	1,505,122	750	123	14.0	11
	1926	6,555	1,929,842	1,943,621	54,673	53,839	63.7	3,345,600	1,392,226	756	102	11.8	10
Louisville & Nashville	1927	5,048	1,712,774	1,785,656	58,724	35,771	59.3	2,439,199	1,154,432	616	115	15.7	17
	1926	5,021	1,793,480	1,869,299	59,805	35,970	59.2	2,463,809	1,168,182	586	123	17.3	20
Seaboard Air Line	1927	4,267	553,435	564,854	7,000	13,749	65.6	761,959	307,942	240	50	17.1	31
	1926	3,904	541,252	553,820	7,437	14,072	65.6	782,287	322,995	258	40	13.4	25
Southern Railway System	1927	8,021	1,981,475	2,008,505	37,646	49,435	62.8	2,786,604	1,090,131	1,081	146	11.9	39
	1926	8,043	2,063,253	2,101,591	37,484	49,195	63.8	2,813,502	1,148,819	1,068	156	12.8	49
Northwestern Region:													
Chic. & North Western	1927	8,463	1,335,357	1,382,603	24,182	33,916	63.3	1,962,431	796,811	726	146	16.8	110
	1926	8,457	1,484,402	1,527,278	24,870	37,180	62.2	2,219,249	913,111	743	161	17.8	104
Chic., Milw. & St. P.	1927	11,202	1,544,864	1,635,918	98,665	46,206	64.3	2,669,404	1,133,932	789	171	17.8	164
	1926	11,189	1,473,076	1,562,858	95,371	43,505	65.4	2,447,317	1,038,983	870	174	16.7	226
Chic., St. P., Minn. & Om.	1927	1,724	279,062	299,124	12,629	6,236	66.6	336,911	137,520	161	37	18.6	31
	1926	1,819	287,511	308,357	11,406	5,954	69.0	310,836	124,426	171	27	13.8	4
Great Northern	1927	8,164	734,044	758,397	44,021	28,661	66.0	1,751,898	848,925	535	155	22.5	136
	1926	8,200	757,561	785,639	42,792	27,463	61.8	1,718,935	806,031	558	157	22.0	129
M., St. P. & S. Ste. M.	1927	4,368	456,184	469,544	3,408	12,423	67.5	661,656	292,642	288	34	10.6	19
	1926	4,372	503,618	517,847	4,783	13,205	69.3	705,789	322,033	300	40	11.8	21
Northern Pacific	1927	6,486	748,822	802,509	41,578	25,292	70.7	1,386 890	616,346	464	142	23.5	92
	1926	6,510	865,454	910,342	48,673	26,700	66.2	1,512,256	639,562	515	141	21.6	87
Oreg.-Wash. R. R. & Nav.	1927	2,154	190,809	202,695	16,941	5,443	70.3	309,619	138,779	139	15	9.7	9
	1926	2,185	191,301	204,715	19,666	5,688	70.2	326,162	150,889	131	20	13.4	12
Central Western Region:													
Atch., Top. & S. Fe (incl. P. & S. F.)	1927	10,377	1,556,803	1,682,869	87,847	49,020	64.5	2,914,680	1,114,544	775	170	18.0	148
	1926	10,143	1,512,789	1,620,830	95,205	48,229	66.6	2,792,602	1,081,386	798	144	15.3	206
Chicago & Alton	1927	995	270,194	294,607	1,813	6,505	59.0	397,579	145,802	142	15	9.5	41
	1926	1,022	289,677	320,307	4,314	7,423	60.4	453,567	187,892	144	19	11.6	40
Chic., Burl. & Quincy	1927	9,334	1,312,173	1,361,439	55,103	38,797	65.0	2,130.761	912,023	735	183	19.9	70
	1926	9,349	1,378,652	1,417,145	48,678	41,018	63.9	2,347,888	1,038,895	787	204	20.6	104
Chic., Rock I. & Pacific	1927	7,573	1,354,910	1,433,295	14,630	35,422	64.1	2,015,076	790,247	565	111	16.4	41
	1926	7,564	1,383,489	1,448,671	15,340	35,527	63.1	2,016,192	760,993	553	152	21.6	38
Denver & R. G. Wn.	1927	2,561	207,733	246,974	44,722	6,072	69.3	352,853	168,521	224	43	16.1	34
	1926	2,572	215,539	255,846	47,018	6,115	69.0	355,047	169,076	237	48	16.7	36
Oregon Short Line	1927	2,539	252,127	266,379	21,256	7,450	69.1	425,493	188,106	174	25	12.3	54
	1926	2,537	282,515	298,946	21,031	8,377	68.7	481.330	215,587	190	24	11.2	58
Sou. Pac.—Pac. Lines	1927	8,750	1,633,342	1,772,612	242,583	51,110	63.2	3,114,854	1,103,603	741	188	20.3	64
	1926	8,534	1,604,201	1,761,073	277,244	49,598	62.6	3,047,697	1,097,347	754	166	18.1	54
Union Pacific	1927	3,714	728,491	746,069	35,155	30,465	72.3	1,624,190	645,140	440	52	10.5	193
	1926	3,691	837,132	858,073	43,579	33,035	67.7	1,816,636	683,234	451	68	13.0	176
Southwestern Region:													
Gulf, Colo. & S. Fe	1927	1,933	339,011	351,308	11,460	10,414	60.7	684,095	306,920	141	29	17.3	26
	1926	1,897	296,625	310,093	7,491	8,568	62.8	543,450	242,781	110	25	18.4	14
Mo.-Kans.-Tex.	1927	1,787	258,931	261,296	5,179	8,977	58.0	541,286	200,663	101	18	14.8	36
	1926	1,787	255,149	255,282	4,764	8,953	60.6	517,388	194,150	105	26	19.5	43
Mo.-Kans.-Tex. of Tex.	1927	1,389	154,836	157,269	2,586	4,264	59.9	258,294	103,007	113	15	11.8	59
	1926	1,389	179,982	184,515	3,387	4,773	60.9	286,932	116,437	122	19	13.3	58
Missouri Pacific	1927	7,321	1,235,743	1,270,239	38,312	34,598	63.2	2,039,207	848,046	526	79	13.0	9
	1926	7,311	1,277,545	1,312,242	39,546	35,676	63.4	2,097,202	890,303	527	95	15.2	3
St. Louis-San Francisco	1927	4,860	765,916	783,358	9,767	18,863	61.1	1,132,755	459,236	396	60	13.2	67
	1926	4,874	781,595	801,936	12,655	19,041	62.1	1,121,548	452,292	440	59	11.8	79
Texas & New Orleans	1927	4,570	729,535	736,910	1,201	15,868	64.4	945,098	389,856	255	57	18.3	33
	1926	4,469	673,326	675,835	2,225	14,350	66.9	806,626	329,791	264	65	19.6	40
Texas & Pacific	1927	1,954	388,298	388,298	652	10,101	58.5	628,621	216,293	167	17	9.3	20
	1926	1,953	313,129	313,129	431	8,213	65.0	465,984	169,806	163	21	11.3	28

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Compared with June, 1926, for Roads with Annual Operating Revenues Above $25,000,000

Region, road and year	Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotive and tender	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles including locomotive and tender	Locomotive miles per locomotive day
New England Region:													
Boston & Albany.....1927	3,255	5,281	8,536	3.0	18,101	1,350	491	19.1	382	30.9	8,021	166	64.6
1926	2,553	5,477	8,030	4.9	15,025	1,171	439	19.5	422	32.8	8,337	172	64.0
Boston & Maine.....1927	13,657	11,833	25,490	6.7	15,207	1,291	515	20.6	328	23.0	4,029	114	58.0
1926	13,597	13,859	27,456	7.3	14,685	1,354	549	20.4	309	21.6	3,956	125	46.7
N. Y., New H. & Hartf..1927	23,327	18,165	41,492	16.6	18,850	1,476	599	21.4	282	19.7	5,467	114	57.1
1926	20,882	21,217	42,099	16.0	17,975	1,483	614	21.8	276	18.9	5,366	121	57.6
Great Lakes Region:													
Delaware & Hudson.....1927	9,177	5,791	14,968	4.8	22,620	1,846	896	30.8	689	35.4	11,778	143	60.8
1926	8,422	6,458	14,880	5.9	22,591	1,809	884	30.9	758	38.1	12,880	151	67.1
Del., Lack. & Western...1927	17,602	7,748	25,350	3.2	22,576	1,831	787	24.7	587	35.8	14,887	127	75.6
1926	17,067	8,401	25,468	4.6	22,120	1,829	823	26.1	628	35.6	16,015	131	80.5
Erie (inc. Chic. & Erie)..1927	36,751	17,973	54,724	6.5	27,303	2,321	984	25.3	535	33.0	12,637	122	59.3
1926	36,237	19,298	55,535	6.8	26,276	2,268	980	25.9	535	31.8	12,782	119	55.0
Lehigh Valley 1927	23,276	8,727	32,003	10.4	25,370	1,822	798	26.1	462	27.6	10,990	140	49.8
1926	21,811	10,001	31,812	5.6	24,621	1,892	858	27.7	554	31.6	13,100	139	52.8
Michigan Central 1927	17,982	16,549	34,531	4.4	27,888	1,870	674	20.2	362	29.4	6,870	103	65.8
1926	17,594	18,022	35,616	4.5	25,802	1,836	648	19.5	355	29.6	6,888	107	65.6
New York Central.....1927	70,380	72,174	142,554	4.0	29,674	2,388	1,035	26.4	463	27.8	10,178	102	54.4
1926	71,595	73,767	145,362	3.9	28,296	2,282	996	26.2	457	27.5	10,249	109	53.2
New York, Chic. & St. L.1927	13,901	10,009	23,910	5.8	25,697	1,873	693	20.3	561	42.9	8,059	107	70.6
1926	13,401	10,560	23,961	6.9	23,736	1,751	666	21.2	566	41.9	8,142	104	71.5
Pere Marquette 1927	11,252	9,215	20,467	3.6	18,730	1,473	605	23.9	422	28.3	3,963	101	67.3
1926	10,191	8,933	19,124	4.4	16,325	1,379	573	23.6	415	27.3	3,640	107	66.7
Pitts. & Lake Erie.....1927	14,000	7,467	21,467	4.6	34,417	3,232	1,894	46.9	347	11.7	32,153	90	53.0
1926	14,870	8,358	23,228	7.2	29,990	2,742	1,581	44.7	292	10.2	29,343	64	54.9
Wabash 1927	15,954	10,926	26,880	2.8	26,617	1,663	612	20.3	506	38.3	5,448	119	62.1
1926	14,733	10,137	24,870	3.1	25,636	1,706	669	22.0	616	42.7	6,134	116	62.6
Central Eastern Region:													
Baltimore & Ohio.....1927	76,016	33,359	109,375	5.1	21,381	1,977	950	32.5	588	29.7	11,606	143	67.6
1926	71,273	35,137	106,410	3.8	20,721	1,910	914	31.5	574	29.4	11,061	148	65.3
Central of New Jersey...1927	18,808	10,623	29,431	4.0	19,584	1,944	913	31.6	277	15.2	11,794	149	49.7
1926	18,935	11,660	30,595	5.8	18,252	1,972	941	32.0	276	14.9	12,224	155	42.0
Chicago & Eastern Ill...1927	14,386	4,531	18,917	22.1	22,091	1,561	691	26.5	312	18.6	6,244	133	51.8
1926	14,358	4,134	18,492	17.9	21,659	1,608	717	25.8	299	18.2	5,849	130	47.8
Clev., Cin., Chic. & St. L.1927	19,395	21,931	41,326	5.0	26,493	2,019	897	28.9	539	31.3	9,381	113	60.9
1926	20,352	21,976	42,328	5.3	26,400	2,088	969	30.2	568	30.7	10,127	110	62.5
Elgin, Joliet & Eastern..1927	9,484	6,760	16,244	6.1	15,464	2,127	1,103	39.3	281	11.2	9,903	128	49.4
1926	9,845	7,630	17,475	5.4	15,803	2,270	1,353	44.7	318	10.9	12,063	122	48.8
Long Island 1927	1,816	5,619	7,435	1.4	4,644	893	349	27.0	74	5.2	1,397	264	34.0
1926	2,094	6,902	8,996	0.9	4,895	860	339	26.3	60	4.2	1,371	289	38.8
Pennsylvania System.....1927	218,032	81,766	299,798	5.6	23,543	2,043	941	29.9	464	24.3	12,840	115	52.8
1926	212,453	85,358	297,811	9.7	21,727	1,938	903	30.6	476	24.6	13,025	122	56.1
Reading 1927	27,088	11,918	39,006	3.3	20,685	1,839	902	34.5	459	22.6	15,844	145	60.5
1926	26,335	13,643	39,978	3.4	20,256	1,842	927	34.5	477	22.9	16,856	152	56.8
Pocahontas Region:													
Chesapeake & Ohio.....1927	28,463	12,838	41,301	3.3	31,340	2,736	1,481	42.9	1,389	56.6	21,647	89	68.4
1926	30,151	9,587	39,738	3.5	30,525	2,702	1,471	44.6	1,468	58.6	22,017	88	66.5
Norfolk & Western.....1927	28,797	9,208	38,005	1.3	39,466	2,953	1,574	44.1	1,219	46.8	20,766	127	60.3
1926	29,637	10,012	39,649	2.1	37,923	2,939	1,606	44.9	1,241	46.3	22,053	127	59.0
Southern Region:													
Atlantic Coast Line.....1927	21,628	9,210	30,838	5.3	19,821	1,493	575	21.4	446	33.5	2,706	107	50.5
1926	21,433	14,483	35,916	4.1	19,135	1,509	598	22.6	477	34.0	3,471	114	60.3
Central of Georgia.....1927	4,671	7,173	11,844	3.0	17,375	1,238	493	21.6	455	31.0	2,839	131	67.4
1926	4,814	7,429	12,243	3.2	17,418	1,266	579	26.5	602	33.5	3,867	142	74.9
I. C. (inc. Y. & M. V.)..1927	42,585	24,356	66,941	7.5	23,734	1,760	726	27.1	749	45.9	7,654	114	81.7
1926	40,985	25,006	65,991	4.3	22,939	1,734	721	25.9	703	42.7	7,079	119	77.7
Louisville & Nashville...1927	44,283	18,049	62,332	9.9	17,448	1,424	674	32.3	617	32.2	7,622	140	84.1
1926	46,050	16,901	62,951	10.8	16,515	1,374	651	32.5	619	32.2	7,755	148	90.8
Seaboard Air Line.....1927	13,502	8,275	21,777	5.6	17,095	1,377	556	22.4	471	32.1	2,406	130	65.9
1926	11,064	10,262	21,326	2.0	16,919	1,445	597	23.0	505	33.5	2,758	125	62.8
Southern Railway System.1927	56,989	24,244	81,233	6.0	19,869	1,406	550	22.1	447	32.3	4,530	143	55.6
1926	52,851	26,110	78,961	5.3	18,567	1,364	557	23.4	485	32.6	4,761	148	58.3
Northwestern Region:													
Chic. & North Western...1927	50,394	28,376	78,770	8.0	17,897	1,470	597	23.5	337	22.7	3,138	130	53.8
1926	50,116	27,284	77,400	7.2	18,495	1,495	615	24.6	393	25.7	3,599	128	57.3
Chic., Milw. & St. P....1927	53,748	21,285	75,033	6.6	21,686	1,728	734	24.5	504	31.9	3,374	126	60.3
1926	55,097	19,638	74,735	6.1	20,606	1,661	705	23.9	463	29.7	3,095	128	52.9
Chic., St. P., Minn. & Om.1927	2,997	8,620	11,617	9.8	14,750	1,207	493	22.1	395	26.9	2,660	118	52.7
1926	3,231	8,478	11,709	9.1	13,554	1,081	433	20.9	354	24.6	2,280	138	53.7
Great Northern 1927	40,923	7,962	48,885	7.4	28,183	2,387	1,157	29.6	579	29.6	3,466	110	38.7
1926	43,188	8,376	51,564	9.5	27,017	2,269	1,064	29.3	521	28.7	3,277	113	38.6
M., St. P. & S. Ste. M..1927	20,185	5,585	25,770	4.5	16,631	1,450	641	23.6	386	24.3	2,233	99	49.0
1926	19,847	6,046	25,893	6.1	15,965	1,401	639	24.4	415	24.5	2,455	102	51.2
Northern Pacific 1927	37,866	6,383	44,249	8.2	23,913	1,852	823	24.4	464	27.0	3,167	131	46.4
1926	36,354	7,359	43,713	8.2	23,350	1,747	739	24.0	488	30.7	3,275	133	48.7
Oreg.-Wash. R. R. & Nav.1927	7,498	4,265	11,763	5.7	19,697	1,623	727	25.5	393	21.9	2,147	162	47.6
1926	7,556	4,003	11,559	5.2	20,203	1,705	789	26.5	435	23.4	2,301	167	49.5
Central Western Region:													
Atch., Top. & S. Fe 1927	59,887	17,975	77,862	5.7	26,183	1,872	716	22.7	477	32.6	3,580	110	62.4
(incl. P. & S. F.)....1926	61,833	17,011	78,844	5.5	25,177	1,846	715	22.4	457	30.6	3,554	112	60.7
Chicago & Alton.....1927	10,586	4,854	15,440	3.8	19,613	1,471	540	22.4	315	23.8	4,884	148	62.9
1926	10,252	4,624	14,876	6.7	19,545	1,566	649	25.3	421	27.6	6,129	144	66.5
Chic., Burl. & Quincy...1927	50,925	16,458	67,383	5.6	21,301	1,624	695	23.5	451	29.5	3,257	126	51.4
1926	51,092	18,007	69,099	6.5	22,219	1,703	754	25.3	501	31.0	3,704	129	49.3
Chic., Rock I. & Pacific..1927	32,834	20,226	53,060	6.8	19,182	1,487	583	22.3	496	34.7	3,478	121	71.4
1926	36,006	19,811	55,817	10.1	18,899	1,457	550	21.4	454	33.6	3,354	132	69.2
Denver & R. G. Wn.....1927	11,270	3,570	14,840	2.8	17,496	1,699	811	27.8	379	19.7	2,194	177	36.4
1926	11,331	2,946	14,277	3.4	16,849	1,647	784	27.6	395	20.7	2,191	176	35.5
Oregon Short Line.....1927	8,100	4,940	13,040	4.5	23,461	1,688	746	25.2	481	27.6	2,469	113	48.2
1926	7,767	3,326	11,093	5.8	23,171	1,704	763	25.7	648	36.7	2,832	117	49.7
Scu. Pac.—Pac. Lines...1927	34,606	31,505	66,111	4.7	24,240	1,907	676	21.6	556	40.8	4,204	116	72.3
1926	32,421	30,152	62,573	5.8	23,190	1,900	684	22.1	585	42.2	4,286	120	73.8
Union Pacific 1927	23,088	7,981	31,069	12.4	36,296	2,230	886	21.2	692	45.2	5,700	101	52.9
1926	21,748	9,317	31,065	12.4	35,748	2,170	816	20.7	733	52.3	6,170	107	58.0
Southwestern Region:													
Gulf, Colo. & S. Fe.....1927	9,543	6,688	16,231	3.4	28,328	2,018	905	29.5	630	35.2	5,293	92	71.2
1926	9,580	4,572	14,152	2.9	26,261	1,832	819	28.3	572	32.1	4,266	100	78.3
Mo.-Kans.-Tex. 1927	8,951	4,069	13,020	4.8	28,747	2,090	775	22.4	514	39.6	3,743	93	75.1
1926	9,272	3,615	12,887	5.0	28,877	2,028	761	21.7	502	38.2	3,621	86	66.2
Mo.-Kans.-Tex. of Tex...1927	299	9,691	9,990	8.7	22,207	1,668	665	24.2	344	23.7	2,472	93	41.5
1926	315	9,426	9,741	9.1	21,112	1,594	647	24.4	398	26.8	2,794	99	44.6
Missouri Pacific 1927	30,609	20,179	50,788	4.8	21,359	1,650	686	24.5	557	35.9	3,861	123	72.2
1926	29,060	21,883	50,943	6.5	21,114	1,642	697	25.0	583	36.8	4,059	121	72.5
St. Louis-San Francisco..1927	22,674	9,506	32,180	3.5	19,941	1,479	600	24.3	476	32.0	3,150	141	57.9
1926	20,512	11,117	31,629	4.9	18,756	1,435	579	23.8	477	32.3	3,093	140	54.4
Texas & New Orleans...1927	11,460	15,207	26,667	6.1	18,421	1,295	534	24.6	487	30.8	2,844	100	78.8
1926	11,372	13,089	24,461	7.1	16,984	1,198	490	23.0	449	29.2	2,460	106	68.8
Texas & Pacific.....1927	6,466	5,750	12,216	4.9	22,692	1,619	557	21.4	590	47.1	3,690	104	70.5
1926	6,268	5,568	11,836	5.6	20,945	1,488	542	20.7	478	35.6	2,897	103	57.0

News of the Week

(*Continued from page* 393)

problems in the United States and Canada. The meeting will also be attended by the three special representatives and the secretary of the Freight Claim Division, A. R. A.

On September 7 the Southeastern Claim Conference, the Virginia Claim Conference and the Eastern Claim Conference will hold separate sessions for the discussion of claim problems of their respective territories.

On September 8 a joint meeting of the three claim conferences, the National Claim Prevention Committee and the executive officers of the Freight Claim Division, together with representatives of the operating department of the 105 railroads and steamship lines which are members of the three conferences, will be held. Representatives of the U. S. Department of Commerce and officers of the Railway Accounting Officers Association will also address this meeting.

A. R. A. to Watch Metric System Developments

The American Railway Association has formed a joint committee composed of representatives of the Engineering, Mechanical, and Purchases and Stores divisions to keep in touch with the efforts being made to bring about the passage of the Britton bill which advocates the establishment of the metric systems of weights and measures by January 1, 1935; this in order to assist the general counsel of the Association and others in charge of the subject in presenting the interests of the railways to those advocating such legislation. The representatives of the Engineering division on the committee are W. D. Faucette, chief engineer of the Seaboard Air Line, John R. Leighty, special engineer of the Southern, W. P. Wiltsee, chief engineer of the Norfolk & Western, and M. J. J. Harrison, general scale inspector of the Pennsylvania. Those of the Purchases and Stores division are J. W. Gerber, general storekeeper of the Southern, J. F. Marshall, purchasing agent of the Chicago & Alton, and E. J. Myers, general storekeeper of the Northern Pacific. The representatives of the mechanical division will be appointed in the latter part of September.

Testimony that the adoption by law of the metric system of weights and measures

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 183 Steam Railways, Including 15 Switching and Terminal Companies

FOR THE MONTH OF JUNE, 1927 AND 1926

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926
Average number of miles operated	238,405.72	237,698.03	59,444.51	59,569.77	5,554.64	5,554.39	39,642.35	39,190.24	133,764.22	133,383.63
Revenues:										
Freight	$381,975,116	$397,840,611	$171,295,424	$180,787,274	$20,844,471	$21,205,933	$50,501,840	$52,534,319	$139,333,381	$143,313,085
Passenger	a 85,955,558	b 92,468,579	44,125,048	46,309,144	1,680,525	1,818,048	10,166,365	12,169,485	29,983,620	32,171,902
Mail	7,771,774	7,756,964	2,982,915	2,949,373	201,727	193,238	1,139,869	1,182,259	3,447,263	3,432,094
Express	11,117,353	12,741,692	5,027,940	6,062,828	226,495	275,678	1,379,112	1,517,816	4,483,806	4,885,370
All other transportat'n	17,646,496	18,230,590	10,167,998	10,632,174	202,263	217,643	857,193	940,500	6,419,042	6,440,273
Incidental	11,699,126	11,758,985	5,738,025	5,875,658	369,495	427,393	1,135,105	1,173,792	4,456,501	4,282,142
Joint facility—Cr.	1,298,444	1,076,038	451,742	451,291	15,090	15,702	307,190	145,977	524,422	463,068
Joint facility—Dr.	434,991	426,176	130,257	127,202	2,556	2,939	30,482	33,360	271,696	262,675
Ry. operat'g revenues	517,028,876	541,447,283	239,658,835	252,940,540	23,537,510	24,150,696	65,456,192	69,630,788	188,376,339	194,725,259
Expenses:										
Maintenance of way and structures	81,636,940	80,195,595	33,235,187	34,096,447	3,350,842	3,509,209	10,571,611	10,616,380	34,479,300	31,973,559
Mainten'ce of equipm't	102,079,341	106,462,061	48,010,115	51,933,737	5,050,302	4,867,861	13,984,507	14,023,321	35,034,417	35,637,142
Traffic	10,522,306	9,902,115	3,863,197	3,596,679	271,023	252,852	1,758,333	1,709,428	4,629,753	4,343,156
Transportation	174,434,714	175,801,658	83,222,095	83,851,667	5,998,724	5,965,518	22,920,684	23,538,688	62,293,211	62,445,785
Miscellaneous operat'ns	4,769,973	4,883,534	2,180,031	2,259,090	78,614	86,951	448,414	508,397	2,062,914	2,029,096
General	15,997,081	15,922,343	7,319,442	7,270,580	611,038	672,956	2,117,231	2,036,357	5,949,370	5,942,450
Transportation for investment—Cr.	1,415,512	1,747,941	243,843	232,468	84,916	70,822	79,451	330,029	1,007,302	1,114,622
Ry. operat'g expenses	388,024,843	391,419,365	177,586,224	182,775,732	15,275,627	15,284,525	51,721,329	52,102,542	143,441,663	141,256,566
Net revenue from railway operations	129,004,033	150,027,918	62,072,611	70,164,808	8,261,883	8,866,171	13,734,863	17 528,246	44,934,676	53,468,693
Railway tax accruals	32,580,353	33,203,275	14,216,006	14,687,882	1,770,056	1,580,031	4,011,374	4,273,347	12,582,917	12,662,015
Uncollectible ry. rev's.	133,307	103,634	65,494	41,505	3,814	1,599	22,279	19,524	41,720	41,006
Ry. operating income	96,290,373	116,721,009	47,791,111	55,435,421	6,488,013	7,284,541	9,701,210	13,235,375	32,310,039	40,765,672
Equipm't rents—Dr. bal.	6,809,295	7,155,078	4,080,200	4,510,653	d 558,812	d 659,600	360,708	545,628	2,927,199	2,758,397
Joint facility rent—Dr. balance	2,117,532	2,172,273	930,866	1,026,162	120,184	89,074	203,531	198,648	862,951	858,389
Net railway operating income	87,363,546	107,393,658	42,780,045	49,898,606	6,926,641	7,855,067	9,136,971	12,491,099	28,519,889	37,148,886
Ratio of expenses to revenues (per cent)	75.05	72.29	74.10	72.26	64.90	63.29	79.02	74.83	76.15	72.54

FOR SIX MONTHS ENDED WITH JUNE, 1927 AND 1926

Average number of miles operated	238,269.28	237,633.96	59,464.52	59,544.55	5,555.09	5,552.78	39,557.31	39,185.39	133,692.36	133,351.24
Revenues:										
Freight	2,262,745,602	2,245,233,186	1,016,329,796	1,009,518,973	124,346,486	116,499,465	317,648,396	328,744,008	804,420,924	790,470,740
Passenger	c 478,618,114	e 505,007,689	241,562,653	247,567,961	10,313,930	10,923,832	66,993,556	80,793,474	159,747,975	165,722,422
Mail	47,098,350	47,457,672	17,945,256	17,945,860	1,232,415	1,256,912	7,023,716	7,171,403	20,896,963	21,083,497
Express	66,807,312	70,294,431	31,194,903	33,163,097	1,514,119	1,538,684	9,102,984	10,320,413	24,995,306	25,272,237
All other transportat'n	101,171,417	101,432,367	57,180,407	57,842,269	1,253,155	1,263,426	5,660,665	6,265,186	37,077,190	36,061,486
Incidental	61,507,997	61,610,203	31,133,331	31,034,417	2,383,953	2,366,221	7,201,578	8,388,109	20,789,135	19,821,456
Joint facility—Cr.	6,919,433	6,381,155	2,742,867	2,599,782	86,019	83,204	1,032,470	857,003	3,058,077	2,841,166
Joint facility—Dr.	2,486,528	2,315,484	805,799	790,409	14,124	13,686	195,734	200,740	1,470,871	1,310,649
Ry. operat'g revenues	3,022,381,697	3,035,101,219	1,397,283,414	1,398,881,950	141,115,953	133,918,058	414,467,631	442,338,856	1,069,514,699	1,059,962,355
Expenses:										
Maintenance of way and structures	425,299,174	414,053,005	175,326,721	173,021,909	19,412,368	18,306,561	60,391,382	62,147,133	170,168,703	160,577,402
Mainten'ce of equipm't	621,417,087	641,880,576	297,491,193	309,573,186	30,177,338	29,483,969	82,217,335	85,062,407	211,531,221	217,761,014
Traffic	60,150,983	55,980,087	22,040,595	20,245,829	1,562,184	1,473,681	10,567,261	10,228,538	25,980,943	24,032,039
Transportation	1,085,222,047	1,079,617,103	519,569,927	512,934,480	37,148,748	36,242,594	146,689,498	155,144,222	381,813,874	375,295,807
Miscellaneous operat'ns	27,432,265	27,339,763	12,810,825	12,699,518	524,195	567,335	3,370,849	3,678,893	10,726,396	10,394,017
General	96,133,930	92,788,426	43,748,944	42,723,252	3,364,015	3,019,970	12,624,276	12,024,240	36,396,695	35,020,964
Transportation for investment—Cr.	6,766,497	7,205,576	1,240,142	870,148	223,996	197,237	797,477	1,424,794	4,504,882	4,713,397
Ry. operat'g expenses	2,308,888,989	2,304,453,384	1,069,748,063	1,070,328,026	91,964,852	88,896,873	315,063,124	326,860,639	832,112,950	818,367,846
Net revenue from railway operations	713,492,708	730,647,835	327,535,351	328,553,924	49,151,101	45,021,185	99,404,507	115,478,217	237,401,749	241,594,509
Railway tax accruals	185,158,595	183,632,276	75,979,983	75,605,283	10,680,746	9,199,173	24,950,765	26,064,743	73,547,101	72,763,077
Uncollectible ry. rev's.	781,152	820,178	326,612	413,370	24,400	19,257	122,115	97,390	308,025	290,161
Ry. operat'g income	527,552,961	546,195,381	251,228,756	252,535,271	38,445,955	35,802,755	74,331,627	89,316,084	163,546,623	168,541,271
Equipm't rents—Dr. bal.	42,382,919	39,131,194	24,112,950	22,607,660	d 2,907,725	d 3,863,597	4,615,582	8,599,539	16,562,112	11,787,592
Joint facility rent—Dr. balance	12,558,992	11,465,720	6,005,999	4,920,179	636,356	585,221	684,159	731,639	5,232,478	5,228,681
Net railway operating income	472,611,050	495,598,467	221,109,807	225,007,432	40,717,324	39,081,131	69,031,886	79,984,906	141,752,033	151,524,998
Ratio of expenses to revenues (per cent)	76.39	75.93	76.56	76.51	65.17	66.38	76.02	73.89	77.80	77.21

a Includes $3,650,359 sleeping and parlor car surcharge. b Includes $3,767,104 sleeping and parlor car surcharge. c Includes $19,716,981 sleeping and parlor car surcharge. d Deficit or other reverse items. e Includes $20,040,168 sleeping and parlor car surcharge.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

would cost the railways of the United States an additional investment of $332,835,000 and an additional annual maintenance cost of $60,000,000 besides $19,970,000 as interest on the additional investment, or a total of $79,970,000 a year was offered by John R. Leighty, special engineer of the Southern, appearing for the American Railway Association, at a hearing before the House committee on coinage, weights and measures on March 4, 1926, as reported in the *Railway Age* of March 13, 1926. Other testimony against the bill was given at that time by Alfred P. Thom, Jr., general solicitor of the Association of Railway Executives, J. V. Neubert, engineer maintenance of way of the New York Central Lines; and W. P. Wiltsee, chief engineer of the Norfolk & Western.

Wage Statistics for May

The Interstate Commerce Commission's monthly summary of reports of wage statistics of Class I railways shows a total of 1,793,141 employees as of May 15, an increase of 1.97 per cent, compared with April. Owing to seasonal requirements the number of employees in the maintenance of way group shows an increase of 40,585, but this was slightly offset by reductions in other groups. The total compensation for the month, $249,146,236, shows an increase of 2.25 per cent.

Compared with May last year the number of employees reported for May, 1927, shows a decrease of 0.86 per cent, but the total compensation shows an increase of 1.06 per cent.

The commission with its summary includes the following tabulation of the average straight time hourly earnings of road, train and engine service employees as reported by Class I railways for the month of May of the years 1924 to 1927, inclusive:

Month of May	Conductors		Brakemen and flagmen		Engineers and motormen		Firemen and helpers	
	Passenger (Cents)	Freight (Cents)	Passenger (Cents)	Freight (Cents)	Passenger (Cents)	Freight (Cents)	Passenger (Cents)	Freight (Cents)
United States								
1924.....	89.0	80.2	62.1	63.4	113.2	93.9	86.8	70.2
1925.....	89.1	80.6	62.1	63.8	116.0	96.4	89.7	72.7
1926.....	89.2	80.3	62.3	63.7	116.3	96.3	90.3	72.8
1927.....	92.4	83.6	64.5	66.5	118.4	96.6	94.4	75.7
Eastern District								
1924.....	87.1	79.9	60.8	62.8	105.3	95.7	81.1	72.1
1925.....	87.1	80.2	60.4	63.1	106.6	96.4	82.2	72.8
1926.....	87.4	80.2	60.9	62.8	106.7	96.4	83.7	73.3
1927.....	92.8	85.6	65.0	67.4	110.4	96.8	90.8	78.0
Southern District								
1924.....	90.4	80.3	63.4	62.9	120.8	95.6	91.3	71.3
1925.....	91.4	79.9	63.7	63.0	120.2	96.8	91.8	72.8
1926.....	91.6	79.2	64.2	63.1	123.2	96.9	92.3	72.5
1927.....	96.7	84.6	67.7	67.0	124.4	97.1	95.8	72.8
Western District								
1924.....	90.3	80.6	62.9	64.4	119.2	90.7	91.4	67.4
1925.....	90.2	81.4	63.3	65.1	125.1	96.0	97.3	72.5
1926.....	90.0	81.1	63.2	65.1	124.5	95.9	97.2	72.2
1927.....	89.9	81.0	63.1	65.2	125.1	96.1	98.0	74.5

Master Blacksmiths Supply Men's Association Exhibit at Buffalo

In connection with the thirty-first annual convention of the International Railroad Master Blacksmiths' Association, held at the Lafayette Hotel, Buffalo, N. Y., August 16 to 18, inclusive, 17 railway supply companies had exhibits or representatives in attendance. The annual meeting of the Supply Men's Association was held on the last day of the convention. The officers of this association were elected last year for two-year terms but due to the resignation of W. R. Walsh, secretary-treasurer, W. W. Criley, Ajax Manufacturing Company, was elected to fill this office. The officers holding over are: President, A. N. Lucas, Oxweld Railway Service Company, and vice-president C. D. Harmon, National Machinery Company. The following is a list of the exhibitors and representatives:

Acme Machinery Company, Cleveland, O.—Model of bolt header and samples of machine forgings. Represented by H. M. Anderson.

Ajax Manufacturing Company, Euclid, O.—Model of forging machine, samples of machine forgings and literature. Represented by J. R. Blakeslee, W. W. Criley, G. G. Fristoe, A. L. Guilford and J. A. Murray.

Anti-Borax Compound Company, Fort Wayne, Ind.—Samples of welding and brazing compounds and literature. Represented by C. O. Kahre.

Buffalo Forge Company, Buffalo, N. Y.—Blowers, forges and machine tools. Represented by E. G. Leonard and J. E. Mossell.

Colonial Steel Company, Pittsburgh, Pa.—Literature on alloy and carbon tool steels. Represented by E. W. Thurber.

Crucible Steel Company of America, Pittsburgh, Pa.—Literature on dies, taps and high speed and special tool steel. Represented by A. E. Jones, J. H. Jones and W. M. Stevenson.

DeRemer Blatchford Company, Chicago—Literature on heat treating furnace equipment. Represented by G. P. White.

Ewald Iron Company, Louisville, Ky.—Staybolt and engine bolt iron. Represented by J. P. Burke and W. R. Walsh.

Firth Sterling Steel Company, McKeesport, Pa.—Literature on bolt and rivet dies, high-speed and stainless steels. Represented by E. T. Jackman.

Heppenstall Forge & Knife Company, Pittsburgh, Pa.—Literature on die steel and carbon-vanadium billets. Represented by D. A. Stuart.

Metal & Thermit Corporation, New York—Samples of thermit welds. Represented by W. R. Brown, H. D. Kelley and E. H. Moore.

National Machinery Company, Tiffin, O., and Chambersburg Engineering Co., Chambersburg, Pa.—Joint exhibit of Chambersburg-National. Samples of forgings, literature on bolt and forging machinery, steam hammers and hydraulic machinery. Represented by E. R. Frost, E. Clark, G. Murray, E. Huber, C. D. Harmon, K. L. Ernst, H. E. Lott and F. W. Mawby.

Oxweld Railway Service Company, Chicago—Oxyacetylene welding equipment and literature. Represented by A. N. Lucas, G. M. Crownover, W. Champieux, L. H. Gill, L. H. Sampson and C. S. Wright.

Pilot Facking Company, Chicago—Samples of packing and literature. Represented by J. Sinkler.

Railway Journal, Chicago—Copies of publication. Represented by E. C. Cook.

Railway Mechanical Engineer, New York—Copies of publications and books. Represented by W. F. Rench and H. C. Wilcox.

Ulster Iron Works, New York—Samples of engine bolt and staybolt iron. Represented by C. F. Barton and L. E. Hassman.

RUNNING TIME of boat trains between Paris, France, and Cherbourg, where connection is made with trans-Atlantic steamers, has been reduced by one hour and a half making the present schedule 5 hrs. 15 min. according to press dispatches from Paris.

Traffic

The Pacific Northwest Shippers' Advisory Board will hold its next meeting at Tacoma, Wash., on September 9.

The American Association of Freight Traffic Officers will hold its twenty-fifth annual meeting at Chicago on September 29.

The Interstate Commerce Commission, on petition of the Chicago, North Shore & Milwaukee, has ordered an investigation of the passenger fares required by the state authorities of Illinois and Wisconsin to be established on this line, in their relation to interstate rates. The company alleged in its petition that its intrastate passenger fares are lower than the interstate fares and that it is not permitted by the state authorities to increase them, and that discrimination against interstate commerce results.

The number of cars of peaches moved north by the Southern Railway this year was 7,746; and the company reports that every one of the 222 special peach trains run to accommodate this traffic reached its destination on time. The majority of these trains were run from Atlanta to Potomac Yards, Va., and Cincinnati, Ohio, and their gross mileage was 121,500. The movement of peaches last year over the Southern totaled 10,870 cars; in 1925 the total was 7,674 cars; 1924, 6,014 cars; 1923, 5,700 cars.

A postponement from September 1 to October 1 of the effective date of the recent order of the Interstate Commerce Commission in the New England divisions case, which prescribed additional increases in the divisions to be allowed the New England lines, has been announced by the commission. It was stated that the postponement was ordered on further consideration of the record in the case and of a petition for reopening and rehearing filed by the Delaware & Hudson. The latter objected to a further depletion of its revenues in favor of the New England lines, saying the order was largely based on a record two years old, and that since then the financial condition of the New England lines had greatly improved relatively to that of the other roads in Eastern territory.

Chicago to Dallas, 12 Hours

The National Air Transport, Inc., Chicago, will establish on September 1 a daily combined passenger and express service between Chicago and Dallas, Tex., in addition to its regular mail service. An airplane will leave Chicago at 5:45 a.m. and will arrive in Dallas at 5:35 p.m. the same day. In the opposite direction a plane will leave Dallas at 7:45 a.m., arriving in Chicago at 7:20 p.m. On the same date this company will also establish express service between Chicago and New York.

Foreign

Standard Rate Basis for Britain

The Railway Rates Tribunal of Great Britain has fixed the standard gross revenue of the four railway systems at £196,632,901 and the standard net revenue at £50,057,847, rate adjustments to earn this return being effective from January 1, 1928. The standard net returns to be aimed at are divided among the four companies as follows: London, Midland & Scottish, £20,326,622; London & North Eastern, £14,787,733; Great Western, £8,312,013; Southern, £6,631,479. In general, rates are fixed on a basis of 60 per cent above pre-war for freight and 50 per cent above pre-war for passengers.

Fatal Derailment in Britain

Twelve persons were killed and a score injured on August 24 near Seven Oaks station, England, in the derailment at a bridge of a London-Deal train on the Southern Railway. The derailment is believed to have been caused by a washout, the result of a heavy rain. One of the cars of the train was sidewiped by the bridge and another completely demolished by collision with it. The other cars in the train overturned.

This is the second serious train accident to occur in England this year, the last one being a collison at Hull in February. The British railways have in the past maintained a low record of passengers killed in train accidents, having had once or twice a complete year with no casualties in this category.

France to Apply Power Brakes to Freight Cars

At the instigation of the French Government, the central managing committee of the French Railways has definitely decided upon a program of installing the Westinghouse air brake system on French freight trains, according to Trade Commissioner Louis Hall at Paris. Air brakes have been used for many years on passenger trains and certain fast merchandise trains. Ordinary freight trains meantime are being braked exclusively by hand.

The question of air brakes for Continental railways has been discussed since several years before the war. Three main systems were proposed—the vacuum, the Westinghouse pneumatic and the Kunze-Knorr pneumatic. This last is widely used in Germany and the vacuum brake is in use in England.

A clause was inserted in the Treaty of Versailles obliging Germany to equip freight cars with a brake which will allow interchange of equipment with allied countries. It has since been established that the Kunze-Knorr system in use in Germany can be used in connection with the Westinghouse. It is proposed to complete the program of air braking in France within five years.

Equipment and Supplies

Locomotives

THE ALABAMA, TENNESSEE & NORTHERN is inquiring for three locomotives.

THE SOUTHERN PACIFIC is expected to enter the market for 30 locomotives.

THE NEW YORK CENTRAL is inquiring for 10 electric freight locomotives with an option on ordering 32 additional electric locomotives.

THE SOUTH AFRICAN RAILWAYS are inquiring through the locomotive builders in this country for 125 locomotives—60 to be Mallets and the balance of various types.

THE GREAT NORTHERN has ordered 6 electric locomotives from the Westinghouse Electric & Manufacturing Company, at a cost of about $1,000,000. These locomotives are to be duplicates of those placed in operation this spring and will also be built jointly by the Baldwin Locomotive Works and the Westinghouse Electric & Manufacturing Company.

Freight Cars

EMPIRE GASOLINE COMPANY.—See Cities Service Company.

THE GREAT NORTHERN will build 200 box cars in its own shops.

THE NORTHERN PACIFIC is inquiring for 200 steel underframes for new flat cars to be built in its own shops.

THE TENNESSEE COAL, IRON & RAILROAD contemplates building 45 ore cars of 50 tons' capacity in its own shops.

THE PETTIBONE MULLIKEN COMPANY has ordered one flat bottom steel gondola car of a capacity of 50 tons from A. V. Konsberg.

THE CITIES SERVICE COMPANY, New York, has ordered for its subsidiary, the Empire Gasoline Company, 100 tank cars of 8,000-gal. capacity, from the American Car & Foundry Company.

Passenger Cars

THE DEPARTMENT OF COMMERCE, BUREAU OF MINES, has ordered one all-steel mine rescue car from Hotchkiss, Blue & Co., Ltd.

THE LEHIGH VALLEY has ordered 4 steel dining cars and 2 steel club-dining cars from the Pullman Car & Manufacturing Corporation. Inquiry for 2 dining cars and 2 club-dining cars was reported in the *Railway Age* of July 16.

THE LEHIGH & NEW ENGLAND has ordered a gas-electric rail motor car from the J. G. Brill Company. The electrical equipment will be supplied by the Westinghouse Electric & Manufacturing Company. The car will have seating capacity for 81 passengers.

Iron and Steel

THE ATLANTIC COAST LINE is inquiring for 12,000 tons of tie plates.

THE BOSTON & MAINE is inquiring for 200 tons of steel for work at Lowell, Mass.

THE BROOKLYN-MANHATTAN TRANSIT has ordered 150 tons of steel from the Fort Pitt Bridge Works.

THE LONG ISLAND has ordered 200 tons of steel for a bridge in Brooklyn, from the Fort Pitt Bridge Works.

THE UNION PACIFIC has ordered 300 tons of structural steel for bridge work in Utah, from the American Bridge Company.

THE PORT AUTHORITY is asking for bids on 150,000 tons of steel for the bridge to be built at New York over the Hudson river, between New York and New Jersey.

THE PENNSYLVANIA has ordered 300 tons of steel for a bridge at Philadelphia, from the American Bridge Company, and has ordered 200 tons of steel for a bridge, from the Jones & Laughlin Steel Company.

Machinery and Tools

THE ERIE has ordered a No. 4 car wheel lathe, from the Niles-Bement-Pond Company.

THE CHICAGO, MILWAUKEE & ST PAUL is inquiring for one 4-ft. radial drill and one 20-in. shaper.

THE NORTHERN PACIFIC has ordered a 16-in. by 36-in. Pratt & Whitney lathe from the Niles-Bement-Pond Company.

NEW YORK CENTRAL has ordered a 90-inch locomotive axle journal turning lathe, from the Niles-Bement-Pond Company.

Signaling

THE INTERBOROUGH RAPID TRANSIT COMPANY, New York City, has ordered from the Union Switch & Signal Company material for the installation of the automatic block system on the local tracks of the lines leading to the Borough of Queens; 130 color-light signals, 400 relays, 130 automatic train stops and other material.

CLERKS OF THE ILLINOIS CENTRAL and the Yazoo & Mississippi Valley have been granted an increase of 5 per cent or an average of 2.73 cents an hour by an arbitration board hearing their demands for increases of 10 cents an hour. The number of clerks affected is 9,700, and the payroll will be increased about $650,000 a year.

Supply Trade

H. B. **Bibb** has been appointed sales manager of the **Graybar Electric Company's** Norfolk, Va., branch house.

R. H. **McGredy** has been appointed sales manager of the Lo-Hed Hoist division of the **American Engineering Company,** Philadelphia, Pa.

A consolidation of the **Industrial Works,** Bay City, Mich., and the **Brown Hoisting Machinery Company,** Cleveland, Ohio, has been approved by the directors of the two companies and now awaits the approval of the stockholders. The new company will be known as the **Industrial Brown Hoist Corporation. A. C. Brown,** president of the Brown Hoisting Machinery Company, will be president of the new company.

C. G. Emil Larsson, who has been appointed chief consulting engineer in charge of technical engineering and bridges of the **American Bridge Company,** with headquarters at New York, was born in Sweden in 1864. He was educated in the University Preparatory School of Sweden and later attended the technical high school at Stockholm, graduating as a mechanical engineer in 1886 and as a civil engineer in 1887. He arrived in the United States during the latter year and started in structural steel work in 1888 with the Wrought Iron Bridge Company, Canton, Ohio, as a draftsman; later in the same year, he went to the Edgemere Bridge Works at Wilmington, Del., and served as a draftsman and designer until that company was absorbed by the American Bridge Company at the time of its organization in 1900. Shortly after, Mr. Larsson went to the Pencoyd plant as a designer and in 1901, he was made division engineer of the American Bridge Company in charge of all eastern designing and drawing work, with headquarters at the Pencoyd plant. In 1904, he was appointed assistant chief engineer serving first at Ambridge, Pa., and later at New York, which position he held at the time of his recent appointment, as above noted.

C. G. Emil Larsson

James H. Edwards, who has been appointed chief engineer of the **American Bridge Company,** New York, in charge of engineering forces and buildings, was born in 1864 at Oxford, N. Y. He graduated from Cornell University in civil engineering in 1888 and then served as chief engineer of the Berlin Iron Bridge Company, East Berlin, Conn., until it was absorbed by the American Bridge Company in 1900. Mr. Edwards first served as engineer of the structural department of the American Bridge Company and from 1901 as assistant chief engineer until his appointment as chief engineer, as above noted.

J. H. Edwards

The Vapor Car Heating Company, Inc., Chicago, has taken over from the **Phillips Metallic Hose Company,** Jackson, Mich., the entire manufacture and sale of the Phillips flexible pipe joint for use in place of rubber steam hose. This flexible metallic joint has been redesigned and is being made in 2-in. size and will be known as the Vapor Company's smooth bore conduit. The Vapor Company will continue to manufacture its other types of joints as required.

The Arch Machinery Company, Pittsburgh, Pa., now represents the **Elwell-Parker Electric Company,** New York, in the Pittsburgh territory, succeeding Frank B. Ward, who after 15 years as Pittsburgh representative has retired; **J. P. Lyons** of the Atlanta, Ga., office has been transferred to the New York office, and has been succeeded by **F. W. Ream; J. S. Cothran** is now representative at Charlotte, N. C., and a short time ago the Baltimore, Md., office was taken over by **J. T. Carroll.**

Westinghouse Air Brake Company

Stockholders of the Westinghouse Air Brake Company have ratified the proposal to change the authorized capital stock o the company from one million shares of $50 par value to four million shares of no par value, the new stock to be distributed to stockholders of record on September 15 on the basis of four shares of new stock for each share of old.

Trade Publications

AMERICAN MULTIPLE THROTTLE.—A brief description of the American multiple throttle, its operation and maintenance, is contained in Bulletin No. 2 issued by the American Throttle Company, 17 East Forty-second street, New York. The same information has also been issued as a wall chart, 25 in. by 27 in., suitable for use in engine houses.

PORTABLE TURBINAIR HOISTS.—The third edition of Bulletin 76-F issued by the Sullivan Machinery Company, Chicago, describes the various models of turbine-driven portable hoists which are designed for many purposes, including car pulling and hoisting materials. The double-drum units are especially suitable for use with drag line scrapers.

"N. & W." TYPE ENGINE COALER AND CINDER PLANT.—In this eight-page pamphlet, the Roberts & Schaefer Company, Chicago, describes the "N. & W." type combined engine coaler and ash handling plant. This one-unit plant, which is designed to handle coal and ashes either at one time or separately, requires the attendance of only one man.

ENGINEERING DATA.—A loose leaf book with binder, issued by the Copperweld Steel Company, contains interesting comparative data and tables on Copperweld, copper and galvanized wires in addition to standard specifications covering the manufacture, inspection and testing of Copperweld wires. A description is also given of molten welding, the process whereby Copperweld is made.

BETHLEHEM DIESEL ENGINES.—A detailed description of the Bethlehem Type S Diesel engine for stationary service is contained in Catalogue F of the Bethlehem Steel Company, Bethlehem, Pa. This engine is of the two-cycle, airless injection, port scavenging type. It supplies scavenging air to the cylinders which clears the burned gases from the cylinder, aids in cooling the piston and cylinder walls, and provides the necessary air for combustion.

PORTABLE AIR COMPRESSORS.—Bulletin 83-F issued by the Sullivan Machinery Company, Chicago, describes two distinct types of gasoline engine and motor-driven portable air compressors. The gasoline units are built in four sizes, 110-ft., 160-ft., 220-ft., and 310-ft. capacities, direct-connected to Buda-engines, and are mounted, together with air receiver, gasoline fuel tank and radiator, on steel frames with canopied top and removable side covers. The electric

units may be secured in capacities of 103-ft. or 206-ft. They are mounted and equipped in the same manner as the gasoline unit, except that the motor and rheostat replace the gasoline engine and fuel tank.

THE MOFFATT TUNNEL.—The story of this great tunnel now nearing completion west of Denver, Colo., is told in text and pictures in a handsome 60-page binder recently issued by Hitchcock and Tinkler, Inc., who are the contractors on this project. It comprises an informative story of the history, development and prosecution of this undertaking in a most entertaining style. The photographs are of exceptional quality and feature all details of the work including the various types of equipment used in the tunneling operations.

ARMCO INGOT IRON—ITS HISTORY AND SERVICE.—The American Rolling Mill Company, Middleton, Ohio, has issued a 48-page booklet in which is outlined the history, including the inception and development, of the pure iron industry. The chemical, physical and electrical characteristics of this company's product are explained and examples given to show its service life. The final chapter, "A Day at Armco," describes the various steps in the process of manufacture as they are seen by a visitor in the plant at Middletown.

HORTON STEEL TANKS.—The Chicago Bridge & Iron Company has issued a 20-page booklet in which is described and illustrated the standard steel structures manufactured by that company for practically every type of bulk storage a railroad might require. The main part of the booklet has specific reference to conical-bottom and ellipsoidal-bottom tanks, two standard designs commonly used for roadside delivery service and in conjunction with water softening plants. Supplementing this, information is given relative to sludge removal from these tanks, as well as the proper type of non-freezing spout and special heating arrangement available for use in cold climates. In addition, the booklet contains tables covering the installation of elevated and flat-bottom tanks, and a diagram for calculating pipe sizes, discharge, velocities and loss of head.

PNEUMATIC CONCRETE PLACERS.—An informative bulletin of 20 pages on the placing of concrete pneumatically, has been published by the Ransome Machinery Company, Dunellen, N. J. This bulletin describes in detail the process of handling concrete by compressed air, and contains a large number of illustrations showing Ransome equipment and actual work where concrete has been placed pneumatically. The economy of the use of pneumatic placers is also pointed out for such work as lining tunnels under traffic, and in open work such as piers, foundation walls, dams, etc. Other information in the bulletin includes data on the rate of placing concrete pneumatically, the length of shots, air requirements, consistency of concrete, size of aggregate, and a separate section is devoted to pneumatic grouting, used to seal fissures, rifts, etc., in various types of concrete work.

Construction

BALTIMORE & OHIO.—A contract has been let to the Ellington Miller Company, Chicago, for the construction of a brick passenger station at South Chicago, Ill. The cost of this station is estimated at $50,000. This company is receiving bids until September 2 for the construction of Zeolite water treating plants at Newcastle, Pa., and Newcastle Junction.

CANADIAN PACIFIC.—A contract for the construction of a four-stall brick roundhouse, a sand house and a cinder pit at Wetaskiwin, Alta., has been let to J. H. Simmons, Winnipeg, Man.

CANADIAN PACIFIC.—A contract for the construction of the substructure of a 76-ft. through plate girder bridge on the Keewatin subdivision of the Manitoba district has been let to Duff, Flint & Co., Regina, Sask. A contract has been let to C. McDougall & Son, Victoria, B. C., for the construction of a brick and concrete roundhouse at Kaslo, B. C. The contract for the extension of the Lanigan-Melfort branch from Melfort, Sask., north 10 miles, has been awarded to Stewart & Cameron, Winnipeg, Man. Grading and the construction of culverts on the proposed branch from Maxstone, Sask., west and southwest 10 miles, will be done through a contract awarded to Riley & Reed, Edmonton, Alta.

CENTRAL OF NEW JERSEY.—A contract has been let to Richardson Hand for the construction of concrete abutments, wing walls and a reinforced concrete deck for a highway bridge at Solomon's Gap, Pennsylvania, which is estimated to cost $26,245.

CHICAGO & NORTH WESTERN.—A contract for the construction of a reinforced concrete foot subway with four sidewalk openings under the tracks of this company at Arlington Heights, Ill., has been let to S. G. Cool, Chicago.

CHICAGO & WESTERN INDIANA.—Contracts for the construction of a freight transfer station and a brick office and equipment building at 27th and Canal streets, Chicago, have been let to the Ellington Miller Company, Chicago, at a cost of about $40,000.

CHICAGO, BURLINGTON & QUINCY.—This company plans the construction of a brick and stucco combined passenger and freight station at Minatare, Neb., estimated to cost about $25,000.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been let to Fairbanks, Morse & Co., Chicago, for the construction of a 150-ton two-track timber coaling station at Limon, Colo.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—A contract has been let to the Ellington-Miller Company, Chicago, for the construction of a reinforced concrete and brick roundhouse and a number of minor service buildings at South Anderson, Ind. The total cost of this work is estimated to be $200,000.

GRAYSONIA, NASHVILLE & ASHDOWN.—Plans have been announced by this company for the reconstruction of a number of bridges, raising of track above flood stage in the Red river and construction of a brick combined freight and passenger station at Ashdown, Ark., to replace a structure destroyed by fire in 1926. The total cost of these improvements is estimated at $100,000.

GULF, COLORADO & SANTA FE.—A contract for the construction of a one-story reinforced concrete, brick and stucco passenger station, having outside dimensions of 104 ft. by 26 ft., at Belton, Tex., has been let to the Ware Company, El Paso, Tex.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—A contract for the construction of a reinforced concrete highway crossing over the tracks of this company west of Chattanooga, Tenn., in Hamilton county, has been let to E. A. Wood & Co., Andrews, North Carolina, at a cost of about $42,200.

OREGON-WASHINGTON RAILROAD & NAVIGATION COMPANY.—A contract has been awarded to J. E. Moore for the construction of a mill building for the plant for boring, adzing, incising and stamping new ties at The Dalles, Ore., estimated to cost about $11,000.

PENNSYLVANIA.—A contract has been let to the Pittsburgh-Des Moines Steel Company of Pittsburgh, Pa., for the construction of a pumping station at Edgeworth, Pa., which is estimated will cost $61,000. A contract has also been awarded to the James McGraw Company of Philadelphia, Pa., for filling and track-laying for additional tracks in the yard at Greenville, N. J., which will cost $150,000. The U. G. I. Contracting Company of Philadelphia, has received a contract for the construction of a new addition to the passenger car shops at Wilmington, Del., at an estimated cost of $200,000. A contract has also been awarded to D. S. Warfel of Lancaster, Pa., for the erection of a new passenger station at Lancaster at an estimated cost of $300,000.

PENNSYLVANIA.—Bids will close on August 31 for the construction of the substructure of a bridge at Martinsville, Ill. This project involves the placing of about 2,000 cu. yd. of reinforced concrete and is estimated to cost $60,000.

PIEDMONT & NORTHERN.—Most of the larger southeastern railroads have filed briefs with the Interstate Commerce Commission opposing the application of the Piedmont & Northern, an electric line, for a certificate authorizing it to connect its existing lines by completing the gap be-

tween Spartanburg, S. C., and Gastonia, N. C., 53 miles, and by building from Charlotte, N. C., via Salisbury, to Winston-Salem, N. C., 75 miles. A large number of representatives of public bodies and commercial organizations, on the other hand, have filed briefs in support of the application, as has the Georgia & Florida, which operates a line from Madison, Fla., to Augusta, Ga., and is now extending its line 56 miles from its northern terminus at Augusta to Greenwood, S. C., where it would connect with the Piedmont & Northern. M. W. Potter, formerly a member of the commission, is of counsel for the electric line, while W. G. McAdoo, formerly director general of railroads, is of counsel for the G. & F. The electric line contends that the commission is without jurisdiction, on the ground that it is not part of a general steam railroad system of transportation, and also that the proposed construction was actually begun before the effective date of paragraph 18 of section 1 of the law and never abandoned. However, it asks that in the event the commission holds it has jurisdiction that the certificate be issued permitting the proposed lines to be built. The Southern, in its brief, as well as some of the other roads, takes the position that the Piedmont & Northern is controlled by the Duke interests that control the Southern Power Company, the Southern Public Utilities Company and other allied companies, and that with the extensions the road would constitute a great plant facility. It is also contended that the lines would divert traffic from existing lines that are affording adequate service. The Seaboard Air Line in its brief asks the commission to take jurisdiction but to hold that the extensions are not in the public interest. Other briefs opposing the application have been filed by the Atlantic Coast Line, the Louisville & Nashville, the Carolina, Clinchfield & Ohio and the Charleston & Western South Carolina. The Georgia & Florida contends that the Piedmont & Northern will introduce into the territory much needed and healthy competition and improve the service to the public.

ST. LOUIS-SAN FRANCISCO.—The general contracts for the construction of a machine shop, power house, wheel shop and wash room and locker building at Yale, Tenn., has been let to J. H. Reddick, Fort Smith, Arkansas.

SOUTHERN PACIFIC.—Bids closed on August 24 for the construction of a brick and tile passenger station, with outside dimensions of 24 ft. by 78 ft., at Marshfield, Ore. The cost of the structure is estimated at $20,000.

SOUTHERN PACIFIC.—A contract for the construction of a two-story brick, hollow tile and stucco passenger station with outside dimensions of 128 ft. by 47 ft. at Harlingen, Tex., has been let to the Ware Company, El Paso, Tex.

VIRGINIAN.—A contract has been let to Haley, Chisholm & Morris of Charlottesville, Va., for second main track work and for the concrete lining of a tunnel in Wyoming county, West Virginia, which is estimated to cost $100,000.

Railway Finance

ATLANTIC COAST LINE COMPANY.—*Stock.*—This company, which holds 27.03 per cent of the stock of the Atlantic Coast Line Railroad, has applied to the Interstate Commerce Commission for authority to issue 58,800 shares of capital stock of a par value of $50 a share, to be issued at par to its stockholders, the proceeds to be used in paying for this company's proportion of a recent issue of stock by the A. C. L. Railroad Company.

CHESAPEAKE & OHIO.—*Excess Income.*—The Interstate Commerce Commission has announced a hearing to be held on March 19, 1928, at Washington, before Examiner N. B. Haley, on this company's excess income reports for the period since September 1, 1920.

CHESAPEAKE CORPORATION.—*Dividends.*—Directors have declared an initial quarterly dividend of 75 cents a share payable October 1 to stock of record September 8.

CHICAGO, MILWAUKEE & ST. PAUL.—*Brief on Reorganization Plan.*—Asserting that the public interest demands continued operation of the St. Paul railway system, and that the capital structure set up in the reorganization plan is so designed as to enable the St. Paul to perform its public duties in an efficient manner, attorneys for the new Chicago, Milwaukee, St. Paul & Pacific have filed with the Interstate Commerce Commission a brief in support of their application for early termination of the receivership and permission to take over control of the old company's lines.

"In the last analysis, the issue before the Commission is simply whether the proposed action is in the public interest," the brief says. "So far as the questions raised by the Jameson intervenors relate to the equity of the reorganization plan as between different classes of security holders, all such questions have already been decided adversely to them by the courts and such decisions are res adjudicata as against the intervenors. Public interest certainly does not require that, in the adjustment of conflicting claims in the reorganization of an insolvent carrier property, security holders shall not compromise their differences and thus avoid the interminable litigation incident to an insistence by all classes upon strict legal rights. Conflicting claims may be compromised where it is obvious that the delay and expense inherent in such litigation would far outweigh any possible advantage to be gained from success, and that failure would be disastrous.

"Every reorganization plan of necessity represents such a compromise, and no tribunal is in a position to do more than see that the respective priorities of the security holders are substantially maintained, or that such adjustments thereof as may be made and not inequitable. Possibly there are other plans than the reorganization plan which would meet the requirements of the St. Paul situation. However that may be, the question now before the commission is not whether there is another practicable plan, but whether there is anything in this reorganization plan which requires the commision to say that the public interest will be adversely affected if the vast majority of security holders are permitted to carry out the contract which they have made. Every day's delay in the consummation of the reorganization costs the property over $2,000 in interest alone which will be saved in the reorganization and retards the return of the system to its full efficiency in the public service."

Briefs in support of the plan also were filed on behalf of the Roosevelt Bondholders' Protective Committee, a committee representing common stockholders and the Iselin committee representing both preferred and common stockholders.

CHICAGO, ROCK ISLAND & PACIFIC.—*Bonds Sold*—Speyer & Co., the National City Company and J. & W. Seligman & Co., have offered at 95 and interest to yield about 4.85 per cent, $40,000,000 secured 4½ per cent bonds, series A, due September 1, 1952. The issuance and sale of these bonds are subject to the approval of the Interstate Commerce Commission and to the approval by the stockholders of the company of the trust indenture securing the bonds.

The proceeds will be used to pay $23,862,000 notes to be presently called (viz., a $7,862,000 6 per cent note to the United States Government, due in 1930; $15,000,000 5 per cent notes, due in 1929, and $6,000,000 4½ per cent notes, due in 1928), to reimburse the treasury for capital expenditures and to provide for additions and betterments.

The bonds will be specially secured by pledge of $45,000,000 Chicago, Rock Island & Pacific Railway Company first and refunding mortgage 4 per cent gold bonds, due April 1, 1934. The trust indenture will contain provisions in effect as follows: (a) that neither the first and refunding bonds nor any bonds prior in lien thereto will be extended; (b) that upon maturity of the first and refunding bonds the railway company (or the successor company, in the event of consolidation) will create a new mortgage in place of the first and refunding mortgage, upon all the properties then subject thereto and will secure the series A bonds, and any other bonds issued under the trust indenture, by the new mortgage equally and ratably with any bonds which may be issued thereunder and (c) that the total amount of bonds to be at any time secured by the new mortgage (together with all outstanding prior debts, after deducting bonds reserved to retire prior debts) shall not exceed three times the then outstanding capital stock of the railway company or its successor.

DETROIT & MACKINAC.—*Abandonment.*—The Interstate Commerce Commission has denied the application of this company

for authority to abandon its Rose City branch extending from Emery Junction, Iosco County, Mich., to Rose City, Ogemaw County, 31.22 miles, with a branch from Smith Junction to South Branch, 0.92 miles, but will permit the carrier to reopen the case after 18 months if it desires to make further showing that operation of the branch cannot be justified. The commission has issued a certificate authorizing this company to abandon its Lincoln branch which extends from its main line at Lincoln Junction, Iosco County, to Lincoln, Alcona County, 14.66 miles, thereby reversing a previous decision in which an application to abandon this branch was denied.

GULF & SABINE RIVER.—*Abandonment.*—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon that portion of its line in Vernon Parish, La., extending from Gravel Pit Junction near Fullerton to the terminus of the line, 8.96 miles, this being a line originally constructed to carry lumber.

ILLINOIS CENTRAL.—*Equipment Trusts Sold.*—A syndicate composed of the Guaranty Company of New York, Graham, Parsons & Co., the Shawmut Corporation of Boston and Alexander Brown & Sons is offering $8,460,000 4½ per cent equipment trust certificates, series O, at the following prices: Maturing July 1, 1928, 4.20 per cent; July 1, 1929-1930, 4.25 per cent; July 1 1931-1932, 4.35 per cent; July 1, 1933-1936, 4.40 per cent; and July 1, 1937-1942, 4.35 per cent.

ILLINOIS CENTRAL.—*Valuation Claim.*—This company, in its brief in support of its protest against the Interstate Commerce Commission's tentative valuation of its properties as of 1915, claims that the property operated by the Illinois Central and valued in the tentative report at $347,680,187, should have been valued at more than $850,000,000. After conferences on the tentative report from April 14, 1925, to October 25, 1926, at which 613 stipulations were executed, testimony was taken in the case for 129 days and the record in the case consists of 10,499 pages and 570 exhibits.

JOHNSONBURG. — *Abandonment.* — This company, which is operated under an agency agreement by the Pennsylvania, and which has a line from Johnsonburg, Pa., to Clermont, 19.62 miles, has been authorized to abandon that portion of its line extending from a point approximately 1.22 miles from Johnsonburg to the terminus, 18.4 miles.

MINERAL RANGE.—*Abandonment.*—This company and the Hancock & Calumet which it leases, have been authorized by the Interstate Commerce Commission to abandon two miles of line from Calumet, Houghton County, Michigan, to Kearsarge.

NEW YORK CENTRAL.—*Stock Authorization Amended.*—At the request of the company the Interstate Commerce Commission has amended its order of December 31, 1923, in which it authorized the New York Central to issue $31,510,620 of additional stock, to reduce the authorization to $26,831,860. Only this amount of stock was issued because the holders of 1915 debentures did not exercise fully the privilege of converting them into stock.

NEW YORK, NEW HAVEN & HARTFORD.—*Preferred Stock Issue Authorized.*—Stockholders at a special meeting in New Haven on August 17 approved by a vote of 1,122,999 to 10,822 shares, a plan to issue 490,367 shares of 7 per cent cumulative preferred stock to be offered to present holders of the Company's common stock in the ratio of one share of preferred stock to each four shares now held and to holders of 39 million dollars 6 per cent convertible debenture bonds maturing in 1948, in the ratio of one share of new stock for each $400 face value of debentures. The purpose of the issue is to pay off in part a debt owing to the government of $87,030,000.

E. G. Buckland, vice-president, in explaining the refunding plan stated that the plan was proposed at this time at the instance of the secretary of the treasury who had received offers from bankers to purchase 60 million dollars of New Haven notes held by the government. Of these, 17 million may be paid off at any interest date but this is not the case with the other 43 million which mature in 1930. Secretary Mellon suggested that the New Haven itself take up the notes by June 1 but later extended the time to October 15 so that the proceeds could be applied toward the reduction of the second Liberty Loan on November 1. Mr. Buckland, in explaining the plan further stated:

"A few stockholders have asked if the preferred stock issue should not be recommended, requiring dividends ahead of the common stock at the rate of 1 per cent more than the interest being paid on the company's debt to the government—whether there should be this preference over the common stock.

"The shortest and most direct answer to these questions is that a 7 per cent dividend payable if earned is a much less preference than the existing 6 per cent notes secured by its first and refunded mortgage bonds pledged at 85; that through the preferred stock issuance this preference is not only lightened, but stockholders are given an opportunity to make an investment in a stock whose dividend requirements have been during the past two years earned 3¼ times over.

"Proceeds of this stock issue will not be devoted to paying off the company's indebtedness to the government, bearing interest at the rate of 6 per cent, to reduce its mortgage secured indebtedness by that amount and so improve capital structure by increasing proportion of stock to bonds from one-third stock to two-thirds bonds as at present, to more than 43 per cent stock and less than 57 per cent bonds, which will be the result of the preferred stock issue. This strengthening of capital structure will improve the credit of the company, so that the balance of its debt may be refunded at a substantially lower rate than would be the case if it attempted to refund the entire amount through a bond issue.

"The reasons which led directors to recommend and arrange underwriting at the rate of 2 per cent upon the par value of the stock to be issued are the necessity of having the entire issue subscribed and the conviction that this will not happen unless underwritten. That conviction is based, among other things, upon the difficulties of reaching all of the holders of the $39,029,000 par value of convertible 6 per cent debentures of 1948, who are entitled to subscribe in the same proportion to the par of their holdings as are the stockholders, and also to the difficulty of reaching large numbers of the owners of the stock who are apparently holding certificates registered in the name of other persons (principally brokers) and endosed in blank. Practically one-third of the entire stock is so held.

"The underwriting will provide the company by October 15, 1927, with $43,000,000, with which to retire the notes for that amount which the government has agreed to withhold from would be purchasers at par. It will assure entire issue being taken and in all probability save the company substantially more than the cost by improving its credit and enabling it to refund the rest of the indebtedness at a lower rate."

Mr. Buckland also said: "If the New Haven were to earn substantially 6 per cent on its common stock over everything, and were able to finance its capital requirements on a reasonable basis, I think it ought to adopt the old rule of a dollar for capital requirements and a dollar for dividends."

I. C. C. Hearing—The hearing on the New Haven's plan to issue preferred stock was held before C. D. Mahaffie, director of the I. C. C. Bureau of Finance, in New York on August 19. Among those appearing for the New Haven were Arthur T. Hadley, president emeritus of Yale University and a member of the New Haven's board of directors, E. G. Buckland, vice-president, E. J. Pearson, president; James L. Richards, Frank W. Matteson and Edward Milligan, directors; B. I. Spock, general counsel and W. W. Meyer, commerce counsel. Particular attention was paid to the underwriting by J. P. Morgan & Co. and to the cost thereof. Just before the hearing closed, Mr. Buckland stated that the 17 million dollar note referred to above had been sold by the government with the provision that it could be called by the New Haven on any interest date. At the hearing, Dr. Hadley made the interesting mark "I see a prospect of dividends not late in 1928."

OLD COLONY.—*Stock Sold.*—A block of 8,917 shares of stock was sold at auction at Boston, Mass., on August 3 to Hornblower & Weeks at $137.125 per share. This issue, previously authorized by the Interstate Commerce Commission, is for the purpose of reimbursing the New York, New Haven & Hartford, lessee, for capital expenditures.

PERE MARQUETTE.—*Equipment Trust.*—The Interstate Commerce Commission has approved the issuance of $2,550,000 4½ per cent equipment trust certificates, series A, to be sold to the Mellon National Bank of Pittsburgh and associates at 99.71, giving an average annual cost to the carrier of approximately 4.546 per cent. The carrier solicited bids from 28 banks and 10 bids were received. The equipment includes 1,520 freight train cars having a total approximate cost of $3,419,912.

WABASH, CHESTER & WESTERN.—*Foreclosure Sale.*—This company will be sold under foreclosure at Chester, Ill., on September 7, by Judge Fred J. Gilster.

Average Price of Stocks and Bonds

	Aug. 23	Last week	Last year
Average price of 20 representative railway stocks..	119.20	119.09	100.25
Average price of 20 representative railway bonds..	95.22	94.93	90.81

Dividends Declared

Bangor & Aroostook—Preferred, 1¾ per cent, quarterly, payable October 2 to holders of record August 31.

Consolidated Railroads of Cuba—Preferred, 1½ per cent, quarterly, payable October 1 to holders of record September 10.

Cuba Railroad—Common, $1.20, payable September 28 to holders of record September 28.

St. Joseph, South Bend & Southern—Common, $0.87½; preferred, 2½ per cent, both payable September 15 to holders of record September 11.

Railway Officers

Executive

T. A. Hamilton has been appointed general eastern agent in the executive department of the Waco, Beaumont, Trinity & Sabine, with headquarters at New York.

C. Boettcher, president of the Denver National Bank and the Ideal Cement Company, Denver, Colo., has been elected chairman of the board of directors of the Graysonia, Nashville & Ashdown, following reorganization of the railroad. **Charles M. Conway** was re-elected president and general manager, with headquarters at Texarkana, Ark. **C. K. Boettcher,** chairman of the board of the Denver & Intermountain, **R. J. Morse,** of Denver and **C. D. Nichols** of Oklahoma City, Okla., were elected vice-presidents. **M. O. Matthews** of Ada, Okla., has been appointed assistant general manager, with headquarters at Nashville, Ark.

Frank I. Snyder, general manager of the Bessemer & Lake Erie, with headquarters at Pittsburgh, Pa., has been elected vice-president, and will assume the duties of that office in addition to his present duties as general manager. Mr. Snyder was born on December 12, 1883, at Greenville, Pa., and was educated in the public and high schools of Greenville and completed a business college course in Pittsburgh in 1903. He entered railway service in October, 1903, as a stenographer in the assistant trainmaster's office of the Pennsylvania at Pittsburgh. In December, 1904, he entered the service of the Carnegie Steel Company in the traffic department. From June, 1905, until May, 1906, he served in the office of the general superintendent of passenger transportation of the Pennsylvania, Lines West, and at the latter time entered the service of the Bessemer & Lake Erie in the office of the vice-president and general manager and served successively as stenographer and clerk, secretary, chief clerk and assistant general manager. In November, 1924, Mr. Snyder was appointed general manager. During federal control Mr. Snyder served as assistant to the federal manager.

F. I. Snyder

Operating

M. C. Williams, assistant superintendent on the Oregon-Washington Railroad & Navigation Company, with headquarters at Portland, Ore., has been appointed acting superintendent of the Third division, with headquarters at Spokane, Wash., succeeding **W. Connolly,** who has been granted a leave of absence.

W. G. Templeton, superintendent of the Nashville division of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., has been promoted to general manager, with headquarters at the same point, succeeding **W. P. Bruce,** deceased. **W. J. McWhorter,** assistant superintendent of the Nashville division, with headquarters at Bruceton, Tenn.. has been promoted to succeed Mr. Templeton. Mr. McWhorter is succeeded as assistant superintendent at Bruceton by **W. A. Swindell,** trainmaster at Atlanta, Ga. **M. O. Armstrong,** dispatcher at Bruceton, has been promoted to trainmaster at Atlanta, replacing Mr. Swindell.

Traffic

Eward F. Leuchtmann has been appointed chief of the tariff bureau of the Michigan Central, with headquarters at Detroit, Mich., succeeding **C. A. Hunt,** who resigned to enter the service of another railroad.

Mechanical

J. S. Hagan, who has been appointed electrical engineer of the Central of New Jersey, with headquarters at Elizabethport, N. J., was born on December 27, 1895, at Monett, Mo., and was graduated from Kansas State Agricultural College in 1916. From 1916 to 1917 and from 1919 to 1924, Mr. Hagan was employed by the Westinghouse Electric & Manufacturing Company on railroad electrification work. From 1917 to 1918 he was a first lieutenant, Engineers, U. S. A. From 1924 until 1927, Mr. Hagan was a special engineer on the Baltimore & Ohio, and on August 1, was appointed electrical engineer for the Central of New Jersey.

Harry T. Bentley, who will retire as general superintendent of motive power of the Chicago & North Western on September 1, was born in London, England, on June 4, 1862, and attended Dulwich college. He entered railway service at the age of 15 as a machinists's apprentice on the London & North Western of England (now a part of the London, Midland & Scottish) and in 1887 he was promoted to foreman of the enginehouse at Chester, England. Mr. Bentley severed his connection with the L. & N. W. in 1892 when he came to the United States and entered the service of the Chicago & North Western as a machinist in the Chicago shops. After a short period at Chicago he was promoted to foreman in the shops at Boone, Iowa, being transferred to Belle Plaine, Iowa, in 1895 and promoted to general foreman of shops at Clinton, Iowa, in 1898. During the same year Mr. Bentley was promoted to master mechanic of the Madison division and on December 30, 1899, he was transferred to the Iowa division, where he remained until August 31, 1902, when he was further promoted to assistant superintendent of motive power and machinery, with headquarters at Chicago. On October 31, 1913, he was promoted to superintendent of motive power and machinery, with headquarters at Chicago, becoming general superintendent of motive power and machinery on May 1, 1922. During the period from February 2, 1918, to June 19, 1918, Mr. Bentley served as assistant director of transportation of the United States Railroad Administration in charge of mechanical matters, with headquarters at Washington, D. C. In this capacity he acted as chairman of the committee organized to prepare plans and specifications for standard locomotives and cars. Mr. Bentley was president of the American Railway Master Mechanics' Association in 1911-1912, president of the International Railway Fuel Association in 1912-1913, first vice-president and president of the Western Railway Club in 1905-1906 and 1906-1907 respectively and chairman of the Committee on Locomotive Design and Construction, Mechanical Division of the American Railway Association, from 1923 to 1927.

H. T. Bentley

George I. Wright, assistant electrical engineer of the Illinois Central (Chicago Terminal Improvement), with headquarters at Chicago, has been appointed engineer of electric traction of the Reading, with headquarters at Philadelphia, Pa., a newly created position, effective August 15. Mr. Wright was

born on July 12, 1889, in New Jersey and graduated in electrical engineering at Leland Stanford University in 1913. He entered railway service in May of that year on the electrification of branch lines on the Portland division of the Southern Pacific, although previous to that time he had been employed for a year as an electrician's helper and meter tester with the Portland Railway Light & Power Company, Portland, Ore. Mr. Wright served on branch line electrification on the Portland division and on other parts of the Southern Pacific as an electrician, as a substation operator, as a draftsman and as a general foreman of electrical construction until May, 1917, when he was advanced to assistant engineer. In November, 1917, he enlisted as a lieutenant (junior grade) in the United States Navy, Naval Reserve, and during the World War served as an electrical officer on the U. S. S. Montana and in charge of the installation of electrical equipment in connection with the construction of 11 submarines at the Portsmouth navy yard. From 1919 to 1922 Mr. Wright was employed successively by the McDougall-Duluth Shipbuilding Company, Duluth, Minn., as assistant superintendent and by the Duluth Electric Company as construction

G. I. Wright

superintendent and he then became an assistant engineer on the Illinois Central (Chicago Terminal Improvement) in connection with the electrification of suburban lines. Mr. Wright was promoted to office engineer in January, 1923, and further advanced to assistant electrical engineer of the Chicago Terminal Improvement in January, 1927, a position he held until his appointment as engineer of electric traction of the Reading, with headquarters at Philadelphia, Pa., on August 15.

J. S. Thorp, distribution engineer on the Illinois Central (Chicago Terminal Improvement), with headquarters at Chicago, has been promoted to assistant electrical engineer of the same department, with headquarters at the same point, effective August 15, succeeding **George I. Wright,** who has been appointed engineer of electric traction of the Reading, with headquarters at Philadelphia, Pa.

Engineering, Maintenance of Way and Signaling

Frederic W. Alexander, district engineer of the British Columbia district of the Canadian Pacific, with headquarters at Vancouver, B. C., has been promoted to the position of engineer of maintenance of way of the Western lines, with headquarters at Winnipeg, Man.

Bert J. Simmons, who has been promoted to engineer of maintenance of way and structures of the Western Pacific, with headquarters at San Francisco, Cal., was born on February 18, 1886, at Chicago. He entered railway service in February, 1904, in the engineering department of the Chicago & North Western at Chicago, becoming an instrument man on the track elevation project of the Chicago Junction a year later. In November, 1906, Mr. Simmons entered the service of the Chicago, Indiana & Southern (now a part of the New York Central as an instrumentman on construction, where he remained until April, 1907, when he became a rodman on maintenance of way on the Tennessee division of the Illinois Central. From October, 1908, to February, 1910, he was successively a topographer, estimator and levelman on preliminary and location surveys on construction on the Chicago, Rock Island & Pacific and on the St. Louis-San Francisco in Texas. From May, 1910, to the entry of the United States in the World War Mr. Simmons was in turn transitman, assistant engineer, locating engineer and division engineer on location, construction and maintenance on the Coast lines of the Atchison, Topeka & Santa Fe. He entered military service in June, 1917, as a captain, and was later promoted to major, in the Eighteenth Engineers, acting as project engineer and camp commander at Sulpice, France, and as superintendent of roads of Base Section No. 2. Mr. Simmons was discharged from the army in May, 1919, and was soon after appointed division engineer on the Northwestern Pacific, later being advanced to engineer of maintenance of way and structures. In January, 1924, he was appointed assistant engineer on the Western Pacific, at San Francisco, a position he held until his promotion to that of engineer of maintenance of way and structures on June 1.

Purchases and Stores

William F. Jones, general storekeeper of the New York Central Railroad, Lines Buffalo and East, with headquarters at West Albany, N. Y., has been appointed purchasing agent, dining service, with headquarters at New York City.

J. H. Waterman, superintendent of timber preservation of the Chicago, Burlington & Quincy, with headquarters at Galesburg, Ill., will retire on September 1 under the pension rules of the company at the age of 74 after nearly 47 years in its service. Forty-six of Mr. Waterman's years of railroad service have been spent in the stores department of the Burlington. He was born near Albany, N. Y., in 1853 and came to the West where he began work in a lumber yard at Plattsmouth, Neb., in 1877. Except for a short period of time in the East during 1878, Mr. Waterman continued in the retail lumber business until he entered railway service on July 1, 1880, as a freight trucker at the Burlington transfer station at Plattsmouth. On December 22, 1881, he became foreman in the lumber yard of the stores

J. H. Waterman

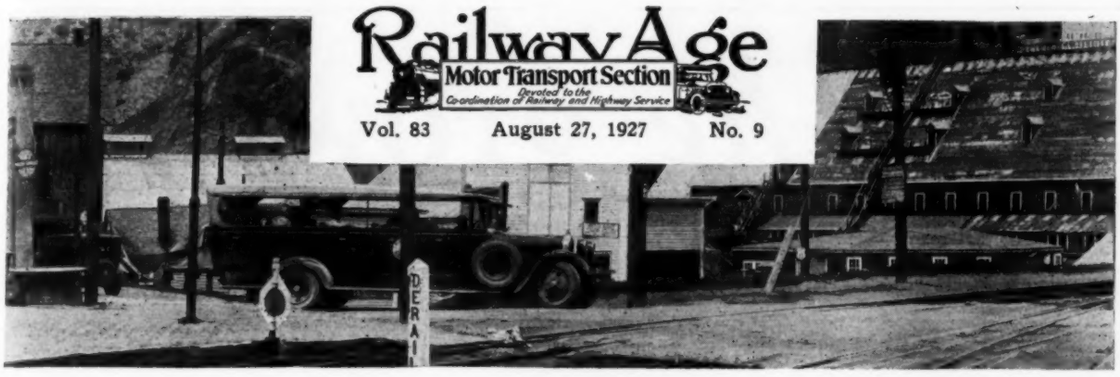
department at Plattsmouth, being placed in charge of the yard in 1882. In July, 1890, he was placed in charge of the maintenance material yard at Lincoln, Neb., and several months later he was appointed storekeeper at the same point. Mr. Waterman was promoted to assistant general storekeeper, with headquarters at Omaha, in 1905, and in 1907, with the consolidation of the stores activities of the lines east and the lines west under one department, he returned to Lincoln as storekeeper. His promotion to superintendent of timber preservation became effective on May 1, 1910, a position he has held continuously since that time. Mr. Waterman served as first vice-president of the American Wood-Preservers' Association during 1913 and as president of the same organization in 1915. He was president of the Railway Storekeepers' Association in 1910-1911, which was before its reorganization and establishment as Division VI, Purchases and Stores, of the American Railway Association.

Obituary

J. R. Mahon, general live stock agent of the Denver & Rio Grande Western, died at his home in Denver, Colo., on August 20, after an illness of a week's duration.

Bernard Edward Morgan, consulting traffic officer of the New York, Chicago & St. Louis, died on August 23, at the Cleveland Clinic Hospital, Cleveland, at the age of 71 years.

Railway Age
Motor Transport Section
Devoted to the Coordination of Railway and Highway Service
Vol. 83 August 27, 1927 No. 9



White Bus in Service of President Coolidge's Party at Lead, S. D.

Contents

Trucks Handle Freight Between Washington and Baltimore ... Page 407

Baltimore & Ohio effects economies by using highways for local l.c.l. freight for way stations on 38-mile section.

Seaboard Operating Two Bus Lines 409

Installations in North Carolina are feeders to railway rather than substitutes for trains—Only part of a comprehensive highway program.

Traffic Development Pushed by N. E. T. 415

H. Price, traffic manager of line, tells of advertising and sales efforts which are bringing the New Haven's subsidiary a remunerative business.

EDITORIALS

Forty-six Railways Use Trucks 405
The Basis of Efficient Tractor and Trailer Operation 405
Railway Motor Bus Operation Spreading Fast 405
What Is "Public Convenience"? 405
The Bus More Than a "Stop-Loss" Device 406
Bus and Truck Lines Going Into Strong Hands 406

GENERAL ARTICLES

Trucks Handle Freight Between Baltimore and Washington .. 407
Seaboard Operating Two Bus Lines 409
The Venti-Duct Heater for Buses 410
The Automotive Air Brake, by H. D. Hukill 411

GENERAL ARTICLES—Continued

Traffic Development Pushed by N. E. T., by H. Price 415
C. N. J. Considers Bus Operation in New York 417
A. C. F. Observation Parlor Coach 418
Tractors and Trailers Transfer L. C. L. Freight at Oakland. 419
Six-Wheel Coach for Use in Congested Districts 421
Rail-Bus Service Between Chicago and Detroit 421
Bus Route Board for the Mechanical Department 422
Coast Bus Line Keeps Careful Repair Records 423
Operating the Motor Bus Safely, by F. S. Hobbs 425
The MacDonald Cash Receipt Holder 427
Motor Transport News 427

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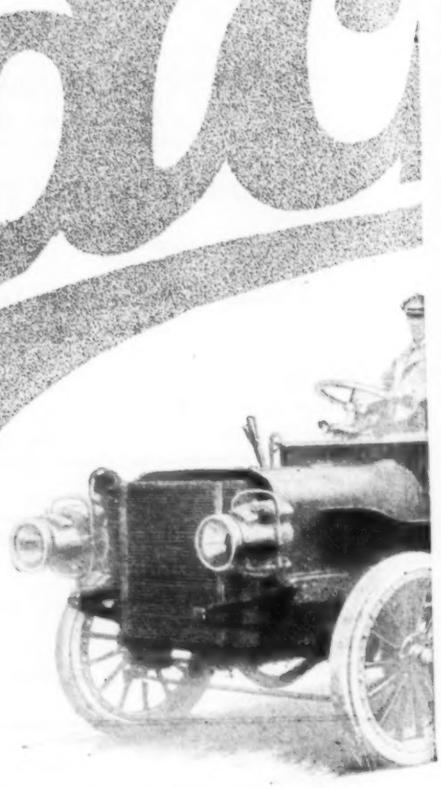
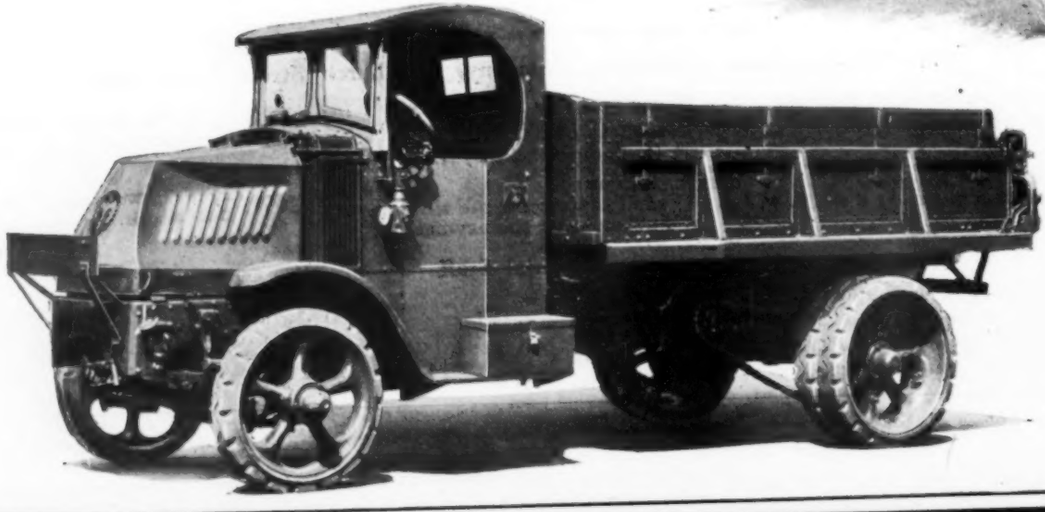




Railway Age
Motor Transport Section
Devoted to the Co-ordination of Railway and Highway Service

Vol. 83, No. 9 August 27, 1927 Table of Contents Appears on Page 71 of Advertising Section

Forty-Six Railways Use Trucks

AN article in the Motor Transport section of the *Railway Age* of June 25, presenting the results of a survey of the operation of motor trucks, tractors and trailers by Class I railways for the transportation of freight, stated that 24 such railways were operating over 1,800 vehicles in this service. Additional data received, together with the news of still further railway expansion into the field of motor truck operation, make necessary a substantial revision of these figures. The fact now is that the number of such railways using trucks, tractors and trailers is 46, this figure including the railways which contract for motor transfer service with the Columbia Terminals Company at St. Louis, and the Cincinnati Motor Terminals Company at Cincinnati. The number of motor vehicles that these railways use in transporting freight is more than 3,400. The Class I railways operate either directly or through contracts 2,459 trucks, 213 tractors and 753 trailers. Trucks, tractors and trailers are used for the transportation of freight in terminals by 40 roads and in line service by 16 roads. Store-door delivery is provided by three railways. More than 250 cities and line sections are served by railway motor trucks. Most of the railways operating trucks, tractors and trailers do so through contracts. The number of Class I railways having contracts with trucking companies is 40, two of these also operating trucks themselves directly. Six roads operate trucks through subsidiaries. Railway operation of motor vehicles in the transportation of freight is still a comparatively new thing, but these figures indicate that it is already a substantial phase of their business.

The Basis of Efficient Tractor and Trailer Operation

EFFICIENCY and economy in the operation of a fleet of tractors and trailers depends almost entirely upon the dispatching system that is used. Inefficient dispatching inevitably results in inefficient operation and needless waste of time and money. The economy of tractor and trailer operation, as contrasted with ordinary motor truck operation, in a service consisting of short hauls and long loading periods lies in the fact that the inexpensive unit, the trailer, does the waiting, while the expensive units upon which the overhead is great, the tractor may be kept constantly at work. The ultimate in efficiency in tractor and trailer operation would be obtained if tractors were kept constantly at work without a pause of any nature and if there were always a tractor immediately available at the moment any trailer was ready to be moved. It is too much to expect that this ideal will ever be attained but many companies approach it. The Drayage Service Corporation, which contracts with the Southern Pacific, the Atchison, Topeka & Santa Fe, and the Western Pacific for the handling of l. c. l. freight between railway freight stations in Oakland, Cal., is one of these. Its ability to keep at the very minimum any waste of the time of either men or machines is due to its dispatching system. Proper dispatching can and does keep the tractors of the Drayage Service Corporation almost constantly at work; it insures motion but prevents waste motion. In this direction lies efficiency and economy.

Railway Motor Bus Operation Spreading Fast

A TABULATION of steam railway bus operation as of July 1, reveals the fact that the expansion of the railways into this phase of motor transport is going ahead at a rate fully justifying predictions made at the beginning of the year. The tabulation shows that 53 railways, about half of which are Class I carriers, are operating 822 motor buses. Forty-four railways operate buses in line service, about two-thirds supplement their train service and the remainder in the replacement of it. Four roads operate buses in city or terminal service, two in tour service and six for the transportation of employees. The aggregate mileage of steam railway bus lines is 7,724. Twenty-eight railways operate buses through subsidiaries, 21 directly and 6 through contracts with independent bus companies. These figures speak for themselves. They prove that the co-ordination of railway and highway service, which all agree is so much to be desired, is being effected by the logical agencies of such co-ordination, the railways themselves. What the situation will be six months from now, no one can say, but if the present rate of progress is maintained, these figures, which present a picture of current railway motor bus operation, may have to be doubled.

What Is "Public Convenience"?

THE New Jersey Board of Public Utility Commissioners is probably one of the busiest regulatory bodies in the country from a standpoint of bus permit applications dealt with. As a natural result it has what seems to be some pretty well defined principles for guidance in reaching its conclusions. What is "public

convenience"? In a recent decision the board denied the application of an independent operator for authority to operate buses between Montvale and Jersey City, competing locally with other bus lines and over the entire route with the Erie. "There is no question but that added facilities will give added convenience," said the Board, "but the question before the Board is whether the proposed route is necessary and proper for the public convenience and properly conserves the public interest." It then quotes from a decision of the Rhode Island Supreme Court to the effect that the word "convenience" in the law does not mean "handy" or "easy of access," but rather "suited to the public need." The Board states that it is of the opinion that the railroad and local bus service in this territory is adequate and reasonable and that added competition would probably attract passengers from existing facilities. In another case a direct bus route was proposed between two points connected otherwise by a roundabout route requiring several transfers. Authority for the direct route was granted. The distinction between "public convenience" in this latter case and that in the first one cited seems reasonably clear and logical. It is upon such decisions that sound regulatory policy as between the various agencies of transportation is being built.

The Bus More Than a "Stop-Loss" Device

THAT the bus can be utilized by the railroad as an agency of economy in substitution for train service on lines of thin traffic is pretty generally recognized. Many of the buses now being run by railroads were placed in operation, not with the thought that they would bring in important net returns, but rather that they could give service required by regulatory authorities at a great reduction in the losses which would be sustained were the same service continued with steam trains. Such use of the bus by railroads, however, while naturally the most appealing in the initial stages, may in the end prove to be less important than the positive revenue-producing capabilities of the vehicle. Railroad passenger traffic is still a source of concern to most railroad officers.

As the figures thus far in 1925 show, bed rock in the loss of business to the private automobile has not yet been reached. Passenger traffic officers are alive to the necessity for the active merchandising of their service. And as a means of attracting more business to the rails the bus, properly co-ordinated, has great possibilities.

Is it not significant that a road like the Seaboard Air Line, which has been studying motor transport with great thoroughness for some time, has as its first bus operation not a line put on in substitution for train service, but rather a feeder operation designed to bring more business to the railroad? The Jersey Central's proposal for bus service in New York would come in much the same category. Other operations of buses by railroads as producers of net revenue either by themselves or for the rail lines are rumored. We would not for one moment try to detract from the importance of the bus as a "stop-loss" device, but railroad ingenuity may turn it into a direct money maker far more important economically than its function as a "stop-less" agency.

Bus and Truck Lines Going into Strong Hands

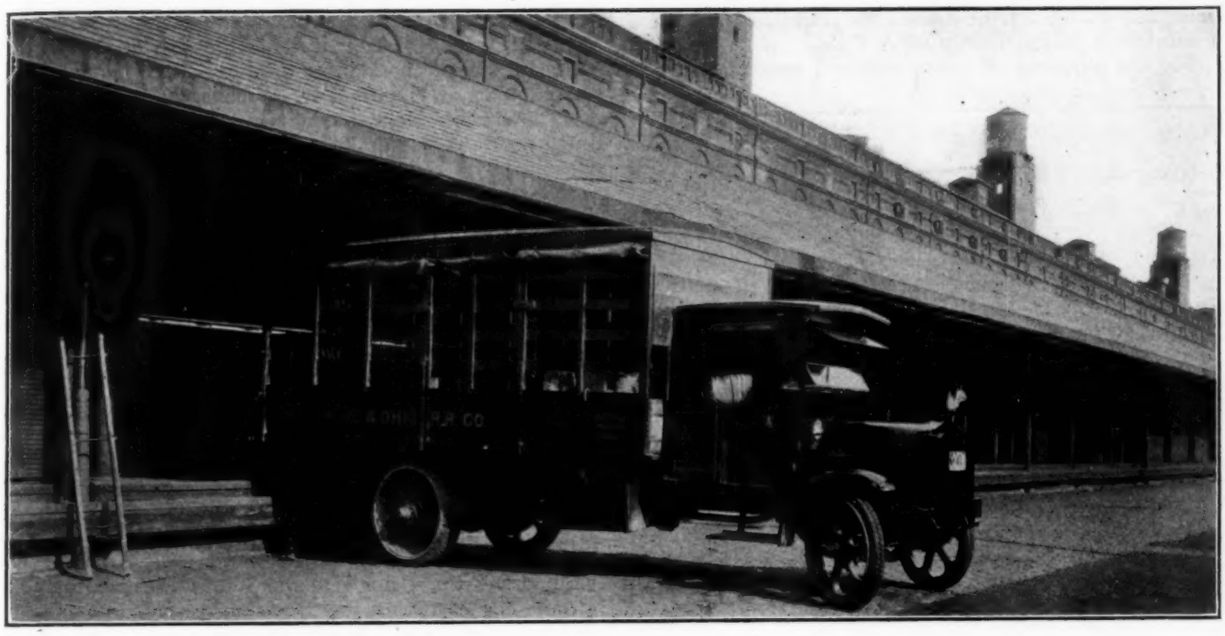
FROM the standpoint of the railways as present or potential operators of buses and trucks, the present tendency of bus and truck lines toward consolidation is of interest and significance. Most railway bus and truck lines, particularly the former, not to mention the railways themselves, are in competition with one or more independently controlled highway carriers. They are, therefore, vitally concerned in the changes in the direction of improved organization and operation and greater financial security, that are taking place among these competitors.

Like most other mediums of transportation, including the railways themselves, bus and truck lines, in the earlier stages of their development, were local propositions, locally financed, locally operated and consequently of only local and therefore minor importance in the transportation business. Many bus and truck lines are still in this elementary stage but in increasing numbers they are passing into the second stage, that of consolidation, following the example of other transportation agencies in this also. Almost without exception the present great railway systems were formed as the result of consolidations of small local railways. Is the present era of consolidation in the bus and truck field to result in the establishment of bus and truck systems of similar scope?

One does not have to go far to find evidence of the trend toward bus and truck line consolidation. In the east the Vanderbilt interests are pushing ahead with bus line consolidation. In the Middle West the Insull interests are absorbing bus lines here and there, and other interests have established a holding company which controls a large mileage of bus lines throughout this territory. On the Pacific coast the Pickwick Stages system, already large, is growing rapidly. The consolidation of truck lines, while not as far advanced as that of bus lines, is nevertheless unmistakably under way.

Of special significance in this connection is the recent organization of several bus and truck line management and operating companies and the entrance into the bus and truck field of a number of long-established public utility management companies. The effect of the entrance of transportation and engineering experts into the field of bus and truck transportation can only be to strengthen the highway carriers.

That all this will result in the advance of bus and truck transportation is certain, but that it will result in benefit to the railways themselves is a question. If all bus and truck lines supplemented railway service their strengthening would be of benefit to the railways, but by no means all, or even a majority, of these lines are of a supplementary character. On the contrary they are the competitors of railways and of railway bus and truck lines. It is generally conceded that if the railways choose to undertake the co-ordination of railway and highway service, they can do a better job of it than any others. In increasing numbers, to protect their patrons and themselves, the railways are undertaking such co-ordinations. A careful consideration of factors that may affect the progress of their development of the bus and the truck as adjuncts of their railway trains is therefore justified. The development of large, strongly-financed bus and truck systems may not have an adverse effect on the railways, their traffic and their plans for co-ordinated bus and truck operation, but it seems more reasonable to expect that it will have.

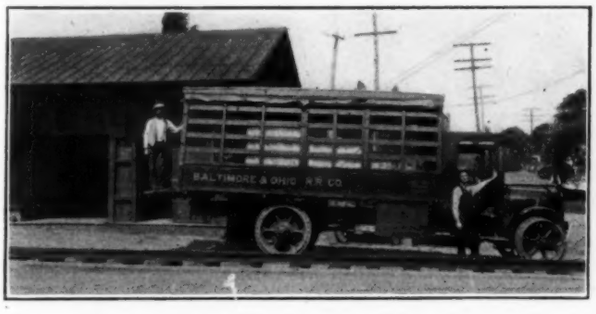


B. & O. Truck Loading at Camden Station, Baltimore

Trucks Handle Freight on B. & O.

B. & O. saves approximately $1,000 monthly on Baltimore-Washington district

AVERAGE savings of $879 monthly have been effected by the Baltimore & Ohio through its operation of motor trucks between Baltimore, Md., and Washington, D. C., in place of package freight local trains on the railway line between these points. In this saving is not included the amount saved through the reduction in repairs to locomotives. Including this figure, the saving derived from the motor truck operation is $1,450 per month. This line, on which package local service has been eliminated, is the main line of the Baltimore & Ohio between Baltimore and Washington, a distance of 38 miles. Fifteen towns, to and from which there are fairly regular shipments of l.c.l. freight in small volume, are located on this portion of the B. & O. These towns are Mt. Winans, Md., West Baltimore, Lansdown, Relay, Dorsey, Jessup, Bridewell, Camp Meade Junction, Laurel, Muirkirk, Beltsville, Branchville, Berwyn, Riverdale and Hyattsville.



Ready to Leave the Dorsey, Md., Station

Movement of L.c.l. Freight Unbalanced

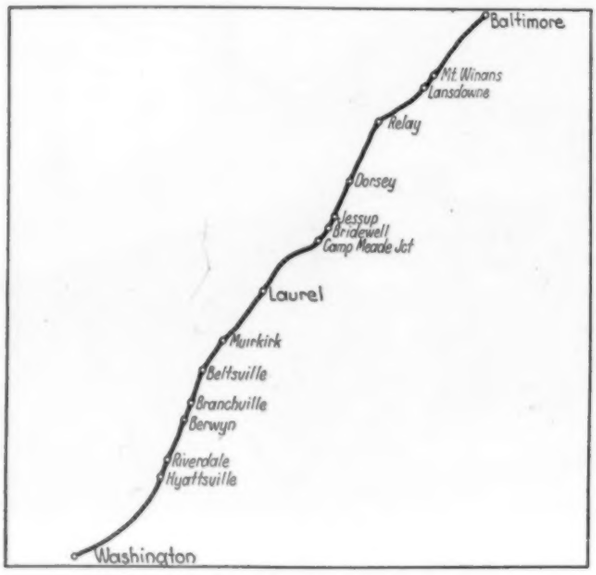
There is a regular daily movement of l.c.l. freight on this line amounting to approximately 20,000 lb. westward from Baltimore and approximately 5,000 lb. eastward from Washington. This business was formerly handled by a package freight local which left Baltimore in the morning, making stops at all stations for the pick-up and delivery of l.c.l. freight until Hyattsville was reached, where it picked up such l.c.l. freight as had been switched to Hyattsville from Washington and returned to Baltimore, making pick-ups and deliveries of eastbound freight at the various stations. It should be noted that through l.c.l. freight from Baltimore to Washington or from Washington to Baltimore was not handled on the package local eliminated.

Unloading L. C. L. Freight from Truck at Lansdowne

On account of the comparatively small amount of l.c.l. freight which has to be handled on this line, only two trucks are required for the operation. Both of

these are owned by the Blue Line Transfer Company, a subsidiary of the Baltimore & Ohio.

For the purposes of the operation a zone station was



B. & O. Line Supplemented by Motor Trucks

established at Laurel which is 19 miles west of Baltimore, and therefore almost exactly in the center of the Baltimore-Washington line of the B. & O. To this station l.c.l. freight is handled daily by train in a car containing usually about 1,000 lb. of freight for Laurel, about 5,000 lb. of freight for the stations on the westerly half of the Baltimore-Laurel line, and about 5,000 lb. for the stations on the easterly half of the Laurel-Washington line. After this car is set out at Laurel, the Laurel freight is unloaded and the balance is left in the car to await the arrival of the trucks from Baltimore and Washington.

One of the trucks leaves Baltimore early in the morning with a load of l.c.l. freight for the stations on the easterly half of the Baltimore-Laurel line. At each of these points, including Mt. Winans, West Baltimore, Lansdowne and Relay, it delivers l.c.l. freight from Baltimore and picks up l.c.l. freight consigned to points west.

At the same time that the westbound truck is leaving Baltimore, the eastbound truck leaves Washington with about 5,000 lb. of l.c.l. freight for local points east of Washington. The Washington truck makes deliveries and pick-ups of eastbound l.c.l. freight at Hyattsville, Riverdale, Berwyn, Branchville, Beltsville, and Muirkirk.

Upon arrival at Laurel, the truck from Baltimore turns over to the truck from Washington any westbound freight that it has picked up on its portion of the line while the Washington truck turns over to the Baltimore truck the l.c.l. freight bound east that it has picked up at the stations on its part of the line. The truck which left Baltimore in the morning, then turns around and starts back to Baltimore, taking with it the 5,000 lb. of freight sent to Laurel in the car and consigned to towns on the western half of the Baltimore-Laurel section, including Jessup, Bridewell and Camp Meade Junction. Proceeding eastward, this truck makes pick-ups and deliveries of eastbound freight at these points as well as at the other stations on its section of the line.

The Washington truck likewise turns around at Laurel with the freight it has received from the Baltimore truck and the 5,000 lb. of westbound freight brought to Laurel in the car and makes the usual pickups and deliveries of westbound freight at the stations between Laurel and Washington.

Two employees of the Blue Line Transfer Company, a chauffeur and a helper, are assigned to each truck.

Two Federal Trucks Are Used in the Baltimore-Washington Operation

Waybills for freight handled on the truck are given to the chauffeurs by the billing agent and are delivered by them.

The trucks used are 3½-4 ton Model W-3 trucks, manufactured by the Federal Motor Truck Company, Detroit, Mich. These trucks are equipped with covered bodies to protect the freight in inclement weather.

Seaboard Operating Two Bus Lines

Extend through service to important resort area—Part of "comprehensive plan"

Bus No. 1 Is a 6-Cylinder Mack

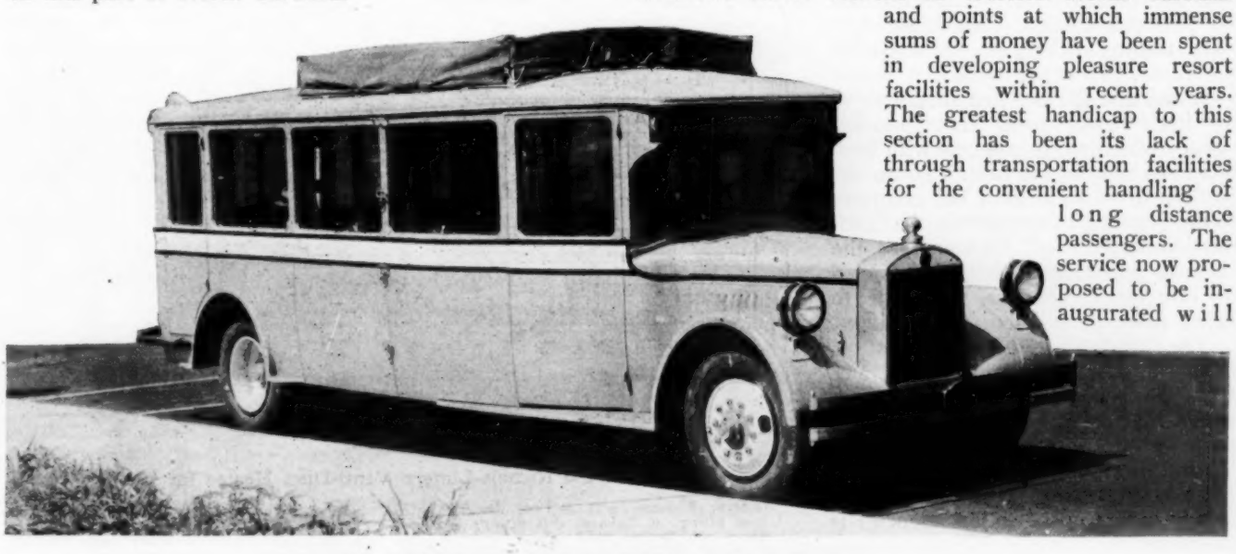
THE Motor Transportation Company of the South, highway subsidiary of the Seaboard Air Line, as was announced in last month's *Motor Transport Section,* has been granted authority by the Corporation Commission of North Carolina to operate two bus lines—one from Rutherfordton to Boone, via Woodlawn, Newland and Blowing Rock, and the other from the same starting point to Chimney Rock, Lake Lure and Bat Cave. The relation of these bus lines to the railroad's line from the East, which terminates in Rutherfordton, is shown on the accompanying map.

The bus lines, as will be noted from this map, are in no sense parallel to the company's railroad line, but rather serve to extend and supplement its rail service to points not previously served. These bus lines, it is stated in the report of the North Carolina Corporation Commission, form part of "a comprehensive plan of furnishing through Pullman car service between the resort sections of the east and west coasts of Florida and from Wilmington, N. C., to the resort sections" in this part of North Carolina.

The operation will be seasonal in character, i.e. from June to October. Continuing, the report of the State Commission says:

"In the inauguration of this service it is the expectation of the Seaboard Air Line Railway Company to develop a considerable summer tourist travel over its lines to the points mentioned; and in order to complete this service, it is the desire of the Seaboard Air Line Railway Company, through its subsidiary corporation, the Motor Transportation Company of the South, to operate a connecting service between the trains which handle these Pullman cars and the principal points in the resort section. . . . It is also the purpose of the Seaboard Air Line Railway Company to establish agencies in the resort section mentioned to sell through tickets and check baggage at those points for railroad destinations on its own lines or any other railway lines throughout the country.

"The points which the petitioner proposes to reach with its subsidiary bus line constitute one of the most attractive resort sections in Western North Carolina and points at which immense sums of money have been spent in developing pleasure resort facilities within recent years. The greatest handicap to this section has been its lack of through transportation facilities for the convenient handling of long distance passengers. The service now proposed to be inaugurated will



An A. C. F. Parlor Type Which the S. A. L. Uses

supply this convenient means of through travel and will, therefore, be of great benefit to the further development of this resort section and of great convenience to through passengers who may desire to reach this section over the Seaboard Air Line Railway. The proposed service will also be of great benefit to points of the Seaboard Air Line Railway intermediate between Charlotte and Rutherfordton in that it will furnish through the tourist

The S. A. L.'s Bus Lines

season at least a Pullman service that has not been available over this line."

No Local Passengers Carried

The issuance of the permit for the Rutherfordton-Chimney Rock-Lake Lure-Bat Cave line was issued with the proviso that no passengers other than those who have railway tickets be carried over the route. In other words, it is not intended that the bus line should serve by itself as a local transportation agency which might compete with local bus lines now in the field. To an objection raised by a local bus company to the granting of the permit, the Commission stated that, inasmuch as the railroad bus line would be restricted to railroad passengers, it ought to bring more people into the territory.

The Rutherfordton-Boone operation, it is stated, parallels local bus lines from Rutherfordton to Marion, between Marion and Woodlawn and, in part, a line from Johnson City, Tenn., through Newland to Marion. Here again, however, competition with purely local transportation agencies is prohibited.

The Venti-Duct Heater for Highway Coaches

THE Venti-duct heater for buses, manufactured by the Nichols-Lintern Company, 7960 Lorain avenue, Cleveland, O., forces fresh heated air into the bus at a rate of from 8,000 to 25,000 cu. ft. per hr. depending on the speed attained. The heated air rapidly circulates around the coach, supplementing the action of the roof ventilators. The heater is also used as a muffler and no exhaust valves are necessary.

The Venti-duct comprises an opening in the cowl with suitable framing for finish. Bolted to this frame, under the cowl, is a chamber distributing air to the heater or directly to the cowl as regulated. The cowl door and heater duct are thoroughly weatherproofed, the excess moisture passing out of a drain at the bottom of the chamber. The Venti-duct collects air at high velocity and pressure at a point that insures it against contamination from the engine. The entrance of large quantities of fresh air gives complete ventilation, and unheated air entrance through window sash and other spaces is minimized.

The air passes to the heater from the Venti-duct through flexible tubing 3 in. in diameter or its equivalent.

The air passes into the heater from the bottom, at a point midway between the ends, where it divides and passes along the heater tubes in both directions. At each end of the heating chamber is an opening into the body with a diameter of 5½ in. through which the heated air passes into the bus body.

The floor fitting consists of an inverted cone that spreads the air in all directions to eliminate any hot spots.

The exhaust line is split with a heavy cast wye, and the exhaust cases are carried to the heater with a minimum of bends and turns.

The outer casing of the heater is constructed of 20-gage cold rolled steel, and measures 3 in. by 6 in. The exhaust gases pass through six one-inch seamless steel tubes, brazed into heavy cast headers. The exhaust, on passing through these tubes, is rapidly cooled by the air passing over them and passes out of the heater to the rear of the coach.

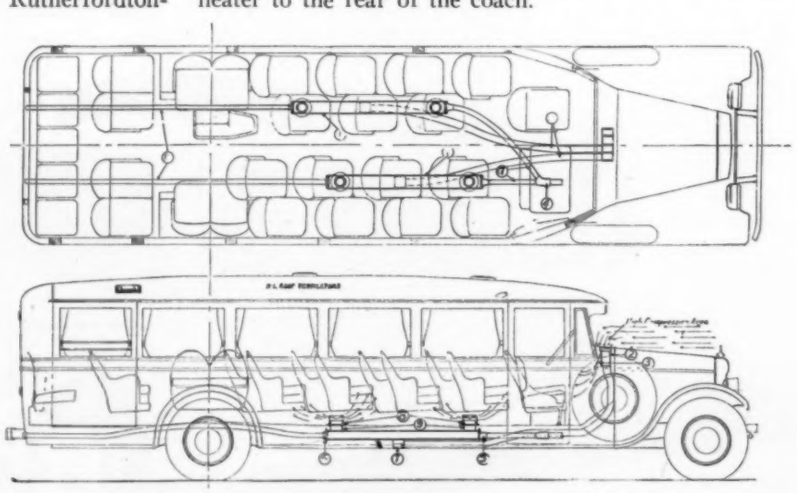
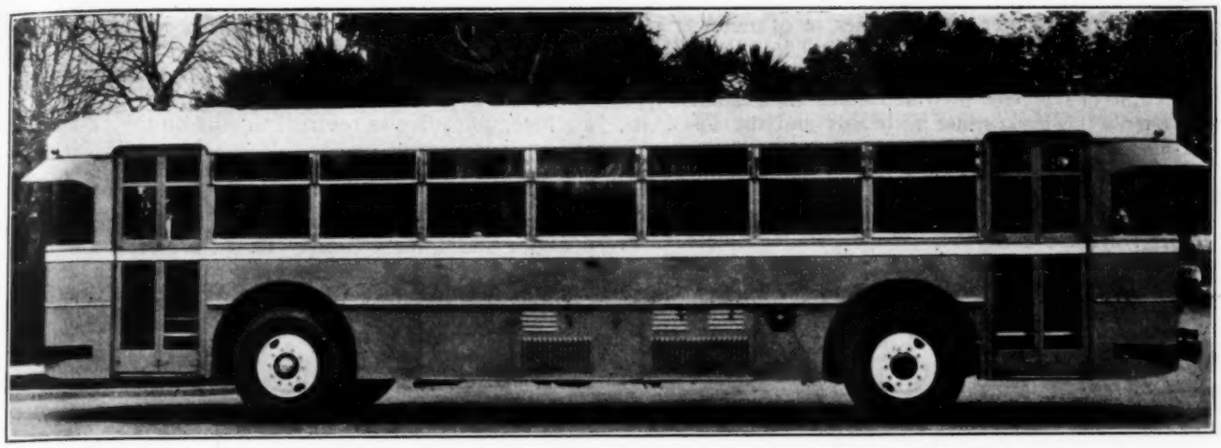


Diagram of the Nichols-Lintern Venti-Duct Heater for Buses

1. Heaters; 2. Venti-duct; 3. Door for cowl ventilation; 4. Exhaust Wye fitting; 5. Exhaust entrance fitting; 6. Exhaust exit fitting; 7. Air inlet fitting; 8. Floor fitting; 9. Hot air duct; 10. Three-inch flexible steel tubing or galvanized iron duct; 11. Two-inch heavy gage flexible steel tubing; 12. One and one-half inch flexible steel tubing or one-half inch exhaust tubing.



Twin Coach Equipped with Air Brakes

The Automotive Air Brake*

Discussion of the design and operation of air brakes for different types of automotive vehicles

By H. D. Hukill

Automotive Division, Westinghouse Air Brake Company, Wilmerding, Pa.

ONE of the first questions usually asked is, "Why is an air brake necessary on automotive vehicles?" I will answer this in rather a backhanded manner, first by describing the equipment itself, then to show the engineering justification for the automotive air brake—in other words—the "why" of it.

Fig. 1 illustrates the fundamental equipment which was designed with the main thought of applying to existing brake riggings more force, with greater flexibility, than is possible through hand or foot actuated mechanisms.

Air is supplied from a high-speed continuous duty compressor, attached directly to the engine, carried to a suitable storage reservoir or twin reservoirs in series, and thence through a graduating type of brake valve, which can be arranged for either foot or hand operation, into brake chambers which take the place of the conventional brake cylinder and piston. The push rods from the brake chambers act on the brake rigging through a suitable connection.

* Abstract of paper presented at the thirty-fourth annual convention of the Air Brake Association, held May 24-27, at Washington, D. C.

Essentials of an Automotive Air Compressor

The essential requirements of an air-compressor in automotive-brake service are reliability and light weight. These necessitate the use of a high-speed machine, so that the total piston-displacement per minute may be the maximum for the size determined upon. A positively-driven or mechanically-operated inlet-valve is necessary for satisfactory high-speed operation, for under these conditions the efficiency of any form of spring-loaded valve is very low because of its inertia and resistance to movement.

Fig. 2 illustrates a typical mounting of this compressor on a bus engine. With this type of compressor the volumetric efficiency increases slightly as the speed is increased up to 1,800 r.p.m., and satisfactory operation is obtained at 2,400 r.p.m. The efficiencies are higher than those which are obtained with slow-speed machines, even of a much larger size.

This compressor is now manufactured in three sizes with displacements of 3, 6 and 12 cu. ft., respectively, at a rated normal speed of 1,250 r.p.m. The 3-cu.-ft. compressor, which has ample capacity for the braking re-

A Three-Car Merchandise Train Equipped with Air Brakes

quirements of passenger motor buses, or of motor trucks and single trailer units, weighs slightly less than 21 lb. The 6-cu.-ft. machine is recommended for motor truck and motor bus service in which other air-auxiliaries, in addition to the brakes, are included; and the 12-cu.-ft. machine for various special purposes.

These compressors are, strictly speaking, continuous-duty machines, and are intended to be driven directly

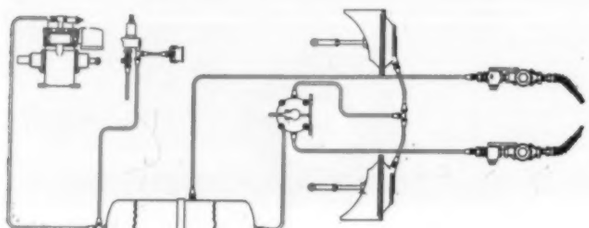


Fig. 1—Fundamental Piping Diagram as Applied to Existing Automotive Brake Equipments

from the engine and to be operated whenever the engine is running, rather than from power take offs on the transmission, which, at best, is in a rather inaccessible location and subjects the compressor to sudden changes of torque during gear-shifting. Special provision for the compressor drive is included on many motor bus and motor truck engines by the manufacturers.

The compressor ordinarily is independently oiled through its own crankcase, which has special provisions for filling with oil and for indicating the level of the oil in the crankcase. Oiling is required at approximately 1,000-mile intervals.

In some cases special compressors of this type have been designed to meet the requirements of engine builders, the cylinders being arranged horizontally and the

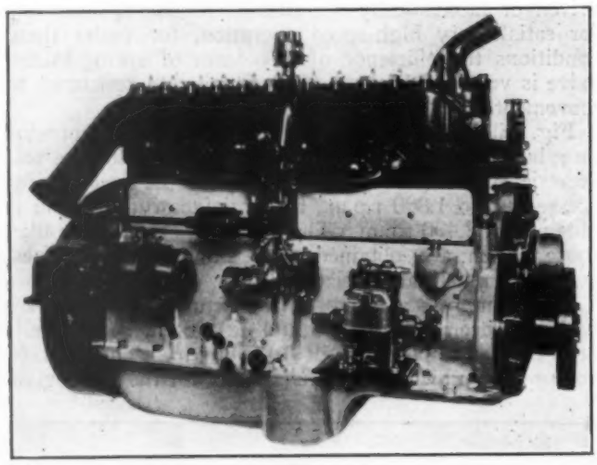


Fig. 2—Typical Mounting of the Air Compressor on a Bus Engine

compressor crankcase being attached directly to the front of the engine crankcase, with a direct spline connection between the compressor crank shaft and the engine crank shaft. On such installations the compressor is oiled entirely from the engine lubricating system.

Governing is ordinarily accomplished by a pressure regulator, or blow-off valve, set at approximately 75 lb. per sq. in., so that after this pressure has been attained in the reservoir, the excess air is discharged to the atmosphere. Under these conditions, the 3-cu.-ft. machine requires 0.5 hp. at 1,250 r.p.m. Any declutching type of governor involves mechanical complications; and with the small power consumption, particularly on the 3-ft. machine, unloading is resorted to only on the 12-ft. unit, and in special cases on the 6-ft. machine. Typical performance-curves for the 3-ft. compressor are shown in Fig. 3. The temperature of the compressor in normal operation will be between the limits shown and depends upon the speed, the pressure, the cooling draft and other conditions of the installation.

As in steam road or electric railway service, the automotive air brake is suitable for handling units in train formation. Fig. 4 shows a truck equipped with air brakes and fitted for trailer connections. Couplings similar to those in steam road service, but of a smaller size, are used, and standard practice provides for emergency protection, through automatic application of the

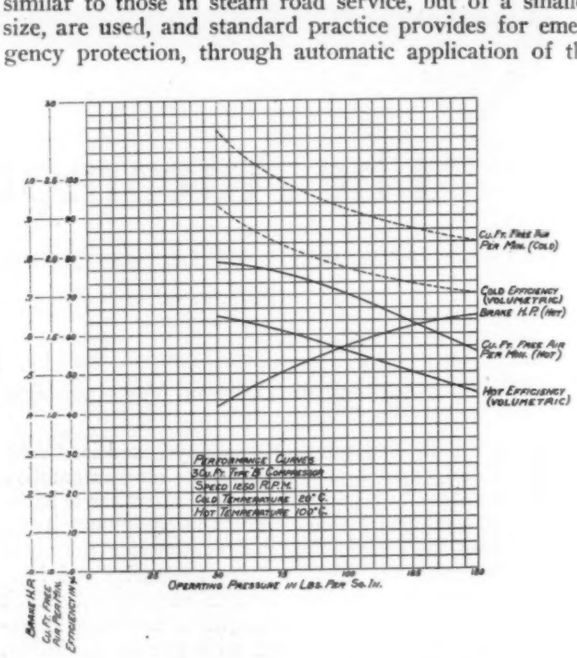

Cu. Ft. Free Air Per Min. (Cold)
Cold Efficiency (Volumetric)
Brake H.P. (Hot)
Cu. Ft. Free Air Per Min. (Hot)
Hot Efficiency (Volumetric)
Performance Curves
3 Cu. Ft. Type "B" Compressor
Speed 1650 R.P.M.
Cold Temperature 20° C.
Hot Temperature 100° C.
Operating Pressure in Lbs. Per Sq. In.
Brake H.P.
Cu. Ft. Free Air Per Min.
Efficiency %

Fig. 3—Performance Curves of a Three-cu. ft. Air Compressor

brakes, on trailers. Two hose lines are used, one to charge the auxiliary reservoirs on the trailer, the other for service applications.

Development of the Automotive Air Brake

The development of the automotive air brake practically paralleled that of the passenger bus, and it quickly became apparent with the operating conditions and design limitations imposed on buses and trucks, that the existing foundation brake rigging with its fabric lining was totally inadequate. These vehicles are required to maintain rigid schedules in the heaviest traffic and to maintain railroad speeds in cross country service, even in mountainous territory. At the same time weights and loads were rapidly increasing, and the introduction of lower bodies and pneumatic tires limited brake drum diameters to less than 18 in.

In an effort to meet these problems, the Westinghouse Air Brake Company several years ago, following along the lines indicated by railway experience, introduced the metal lined brake, or, as it is called, the metal-to-metal brake, as an adjunct to the air brake. The metal-to-metal brake immediately became popular, and has since been turned over to the axle and vehicle builders as a contribution to the general industry. At the same time

improved brake drums have been developed, and many types of specially compressed fabric, and moulded composition linings are being introduced as specially adaptable for the heavy duty service requirements of present day operation.

With the introduction of the metal brake, the builders were quick to realize the advantage of mounting the brake operating mechanism on the axle, and eliminating all unnecessary linkage, especially operating members interposed between the axle and chassis, and subjected to the variations imposed by spring deflection.

Fig. 5 shows a standard axle unit designed to include brake chambers and metal brakes as integral axle units.

The brake chambers are attached to the axle-housing by a suitable mounting bracket, which also includes a camshaft bearing. The internal expanding shoe-heads are solidly hinged at one end and are expanded at the other by a 180-deg. constant-lift cam. An ingenious worm wheel type slack adjuster is included as a part of the brake chamber assembly, and slack is quickly taken up by the rotation of a fixed nut on the end of the worm-shaft, which rotates the camshaft through any desired angle. The available cam-lift is sufficient to provide for adjustment through the total thickness of the lining. Air connection to the brake chambers is made through flexible tubing anchored to the frame.

The hand-brake may be connected with the metal brake, but in some cases an entirely independent hand-brake is attached to the propeller shaft.

Metal brake shoes ⅜ in. thick are bolted to the brake-heads and cover an arc of approximately 90 deg. Combination cast steel head and shoe, all in one piece, are now being used by several builders.

The slack adjuster and brake chamber unit is shown in Fig. 6. The camshaft is splined or keyed into the worm wheel and the brake chamber is connected to a lug on the housing. In normal operation there is no relative movement between the worm and worm wheel and the force from the brake chamber push rod is transmitted directly to the camshaft. Brake adjustment is secured by turning the nut on the end of the worm shaft, which rotates the cam shaft to any desired position without disturbing the location of the operating arm with respect to the brake chamber. A ball and spring lock keeps the worm shaft anchored against accidental rotation from road shocks and vibration.

The "Why" of the Automatic Air Brake

The foregoing gives you a general idea as to the operation of the automotive air brake—namely, the "how" of it. Now, as to the "why," from the engineering viewpoint.

The legal weight limit in most states is from 26,000 to 28,000 lb. and many buses and trucks are crowding this very closely today. Forget for a minute any possibility of four-wheel-brakes, and consider a vehicle with a gross weight of 20,000 lb. with 60 per cent of 12,000 lb. on the rear axle. It is axiomatic for safe operation that the brakes should be capable of locking the wheels under normal operating conditions.

In rail service, a coefficient of road adhesion of .2 to .25 is all that may be expected. On the highway, it is often above .8, although .6 may be taken as a representative average. In rail service, brake action takes place at the circumference of the wheel, on highway vehicles an 18 in. diameter brake on a 36 in. diameter tire, or just 50 per cent, is absolute maximum. In other words, at the brake drum on the above vehicle, a circumferential

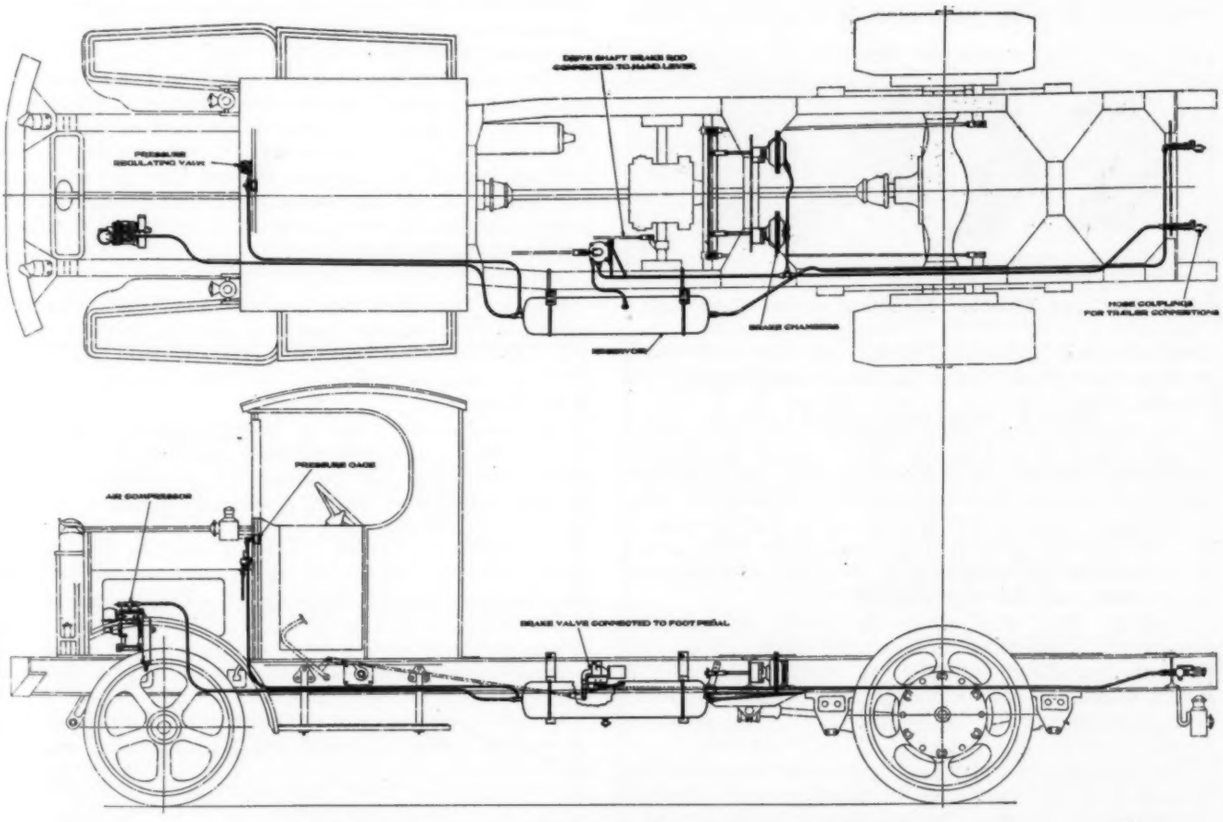


Fig. 4—Piping Diagram of Truck for Handling Trailer Units

braking force of 14,400 lb. (12,000 x 0.6 ÷ 0.5) is required to lock the wheels on a dry level road. It might be mentioned that on account of the small space inside the tire diameter, internal expanding brakes must be used. We must consider that an ordinary brake lining has a coefficient ranging between 0.4 when it is new to as low as 0.15 when it is glazed, overheated, or oil or water soaked. Therefore provision must be made for excess pedal travel to take care of the following:

1—As much as ⅛ inch expansion in brake drum diameter—Brake drums do get hot often as high as 1000 deg. F; one of the difficulties of the operating man has been failures of tires due to heat transmitted to them from the brake drums.
2—Normal compression of brake linings under pressure.
3—Sufficient brake lining wear to insure a reasonable interim between brake adjustments.
4—Lost motion and wear in the operating linkage.
5—As much as a 1 inch to 1½ inches variation in the effective length of brake rods, due to spring deflection—rubber shackles, etc.

We must then realize that with the ordinary foot actuated brake, the only force available is 150 lb. or at the outside 200 lb. pedal push, through a maximum move-

Fig. 5.—Brake Chamber Mounting on the Rear Axle

ment of about 10 in.; and it does not take a slide rule or even an engineer to see the total inadequacy of such a brake today.

Any number of so-called remedies have been tried—various forms of self energizing or "wrap up brakes," mechanical "servo" mechanisms, variable ratio arrangements, etc., a description of which is beyond the scope of this paper, except that it may not be out of order to say that up to the present time a real power brake, which is provided by air operation, is the only thing that has satisfactorily met the requirements.

Consider the "why" from the traffic or operating standpoint. Four-wheel brakes were disregarded in the previous reasoning, but they are rapidly advancing in favor, which, of course, means even greater performance requirements for the brake system. The reason is simple.

The operator of today has been quick to realize that to gain and hold patronage he must provide schedules comparable to those of the interurban electric car or to the privately owned passenger automobile, hence the popularity of the high powered six-cylinder chassis. These buses are capable of accelerating and keeping speed with the fastest traffic of the day—in congested city streets or the crowded interurban artery. But they are required to operate on the same highway with the light-weight four-wheel braked passenger car, which can literally stop in less than its own length; and unless they have adequately effective brakes they must keep a safe distance from the car ahead, as demanded by the almost universal rule of motordom which says, "Responsibility rests with the man behind." This space offers a temptation for cars to slip in ahead of the bus, with the result that even though it can hold its place when the "line starts moving" it will move progressively backward in the general traffic line. The air brake corrects this situation by providing a reserve retarding effect equivalent to that on even the lightest passenger car, which is always ready when required.

Consider the "why" from the operator's or driver's viewpoint. Did you ever watch a bus driver on a busy trip? If not, do so, it is a liberal education, for he is busier than the proverbial one armed man with the itch. He stops, swings around a parked car into the curb to pick up a passenger (it's a man's job even to handle the steering wheel, especially since balloon tires have come into favor), opens the doors, admits the passenger, takes fare, make change, answers questions, issues transfer, and at the same time has closed the door, swung back into the traffic line, shifted gears three times to get up speed (did you ever try to depress the clutch on some of these buses?), grabs all the brakes he has, and comes up standing inches from a presumptuous flivver that has ambled from a side street; and thus the vicious cycle continues. It is an old story that most of the traffic accidents occur between 4 and 6 p. m. Watch the bus driver and you will see one good reason for this. Air brakes, therefore, become a most important factor in safe operation—considered from the human as well as the mechanical standpoint.

There are now approximately 5,000 sets of automotive air brake equipment in service. You will find them wherever railroads and traction properties have gone into bus operation, in many cases 100 per cent fleets, running up into the hundreds of units. They are also rapidly finding a place in motor truck transportation with public utilities, oil companies, milk transportation and telephone construction.

THE BUS DIVISION of the American Automobile Association makes public the following news item from Kansas City: "Eight more tourists traveling from Los Angeles to eastern cities by bus today were stranded in Kansas City, making a total of fourteen in two days.

"The travelers told George M. Husser, manager of the Better Business Bureau, they had purchased their tickets from a Los Angeles travel bureau which promised to arrange transportation for them out of Kansas City over licensed bus lines operating here.

"The Kansas City Travel Bureau to which the Los Angeles concern directed them, however, has no arrangements for handling passengers of the western bureau, and no funds for their transportation out of Kansas City were forwarded here. The drivers who brought them from Los Angeles could not be held responsible as they had been hired by the Los Angeles concern to take the tourists no further than Kansas City."

The above quotation, says the Bus Division, indicates again in an emphatic manner the urgent need for regulation of interstate motor carriers.

Three Macks in Service of Eugene Street Railway, Owned by the Southern Pacific

Traffic Development Pushed by N. E. T.

Advertising and personal solicitation regularly utilized —Special party business sought

By H. Price
Traffic Manager, New England Transportation Company

IN the New England Transportation Company, our efforts to develop and maintain traffic for our buses have been intended, first, to interest prospective patrons in our service and, second, to make our service so attractive that it will automaticelly sell itself after it has once been tried. To call attention to our service, we make use of personal solicitation by our traffic representatives or by those of the New Haven, and of advertising—newspaper, direct by mail and poster. Special party business as well as the regular every day travel in our buses is sought.

Advertising through the medium of newspapers has been employed largely to the extent of announcing the establishment of service with occasional small campaigns to keep our commodity before the public, the latter particularly on competitive routes. No extensive newspaper advertising campaigns have been conducted and the space which we have used has been confined entirely to newspapers, no class mediums having been used other than in the case of representation in the classified columns of the several telephone directories which, in itself, is very helpful.

The accompanying illustrations indicate the kind of advertising that we have done.

As the actual travel and potential travel on our regular routes is more or less of a retail character, our sales depend upon the class of service which we render; in other words, our thought is that once we interest the travel on our routes our service will automatically sell itself for ensuing trips; therefore, we have depended largely upon our timetables as a medium of advertising.

Worcester-Providence

FITCHBURG
Every hour at 30 minutes past the hour
90c

Connections at PROVIDENCE for FALL RIVER NEW BEDFORD NEWPORT NORWICH BRISTOL
Eastern Standard Time

Announcing an arrangement of LIMITED STOPS and distinct schedule improvements commencing April 24th.

Coaches leave Providence every hour on the hour — leave Worcester every hour at 30 minutes past the hour

One Way, $1.25
Round Trip, $2.00

Latest type deLuxe Coaches—Comfortable Seats — Competent Operators — Reasonable Fares.

From Providence	From Worcester
New Eng. Coach Term Union Coach Term	Union Railroad Station Park 3991

New England Transportation Company

MAROON COACHES

Safety - Courtesy - Dependability

Newspaper Advertising Is Used Principally to Announce New Routes or Schedules

Safety
Dependability
Comfort

DeLuxe Highway Service

NEW LONDON NORWICH HARTFORD

"the comfortable way—conveniently scheduled service without transfer, balloon tire coaches affording unexcelled riding comfort"

5 Daily Round Trips

Eastern Standard Time

LEAVE NEW LONDON RAILROAD STATION	LEAVE NORWICH RAILROAD STATION	LEAVE HARTFORD BONDMORE HOTEL (High & Allyn Sts.)
7.30 a.m.-10.30 a.m.-12.00 p.m. 1.40 p.m.-3.05 p.m. (6.30 p.m. Sun. & Hol.)	8.10 a.m.-11.10 a.m.-12.40 p.m. 2.20 p.m.-3.45 p.m. (7.10 p.m. Sun. & Hol.)	7.45 a.m.-10.30 a.m.-12.00 p.m. 1.30 p.m.-3.00 p.m. (6.00 p.m. Sun. & Hol.)
$2.10	$1.75	$1.75 NORWICH $2.10 NEW LONDON

Direct Service Norwich-Providence
8.00 A.M.-12.00 P.M.-4.00 P.M.

ADDITIONAL SERVICE NEW LONDON-NORWICH

Tickets and Timetables at any Railroad Station

RESPONSIBLE OPERATION

New England Transportation Company

REASONABLE FARES

Maroon Coaches-Standard Service

Advertising Attracts New Riders—Good Service Holds Them, Says N. E. T.

Wide Distribution of Timetables

Individual leaflets have been printed for each route and these leaflets are distributed not only at railroad stations, but a generous distribution is accomplished through hotels, stores, travel information bureaus, etc.,

so that the public may become familiar with our routes. In addition to the leaflets, a general folder is prepared showing our complete service, copies of which are distributed to all railroad stations, and to connecting railroad lines which distribute to their connections. Copies are left at all hotels, resort bureaus, travel information bureaus and many of the larger mercantile houses and manufacturing plants as of interest to salesmen and buyers, etc. Some 130,000 copies of this general folder are printed and distributed each year and the leaflets are distributed in quantities varying from 10,000 to 90,000 per year, depending upon the route involved.

As our regular travel is composed of individuals, no direct solicitation is made as that is a rather difficult problem to approach, but we have felt that the methods which we have followed, in connection with the character of service which we render, have produced satisfactory results.

Special Parties Solicited

Solicitation is undertaken in connection with special parties, this being a very profitable part of our operation insofar as it is possible to handle it without involving the peak travel. Normally on week days and, in some cases, on Saturdays and Sundays, depending upon the schedules, we are prepared to handle a considerable volume of special parties.

Direct solicitation is employed in the case of manufacturing concerns, department stores, etc., where we have knowledge of proposed annual summer outings, visitations of lodges, picnics, entertainments, etc., and in this connection we are ably assisted by the traveling passenger agents of the New Haven who undertake this solicitation for us when they have a knowledge of proposed movements or, in the course of their regular solicitation, encounter an apparent demand for motor coach service.

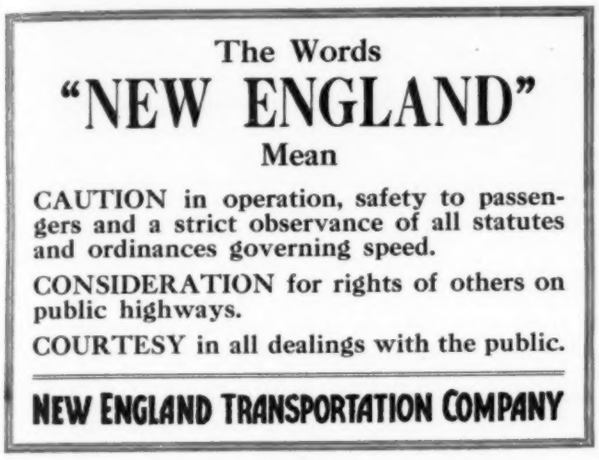
In order to keep our product before organizations which are likely to require special service of this character, either at the present time or in the future, a direct mail program has been undertaken. The solicitation card employed for this purpose is reproduced herewith. The results from this direct mail advertising have also been satisfactory and it is proposed this fall to issue a further appeal in the shape of a calendar which will more likely be retained by prospective parties.

System and Local Timetables Issued by N. E. T.

Rates for Special Parties

In connection with special party movements, we have a basic rate of 50 cents per mile for liveload mileage, plus 30 cents per mile for necessary deadhead mileage, with a minimum charge of $30 per coach per movement, including four hours waiting time. Waiting time in addition to four hours is computed at the rate of $4 per hour or fraction thereof.

Because of competitive conditions, and there is considerable competition for special party movements, it is not always possible to observe these prices strictly and some elasticity is necessary. However, we do not undertake to move parties which contemplate a payment of less than 50 cents per mile except in rare instances. The above basis of charging contemplates a reasonable return for this character of service.


The Words
"NEW ENGLAND"
Mean
CAUTION in operation, safety to passengers and a strict observance of all statutes and ordinances governing speed.
CONSIDERATION for rights of others on public highways.
COURTESY in all dealings with the public.
NEW ENGLAND TRANSPORTATION COMPANY

Posters Are Widely Used by the N. E. T.

Business Showing Steady Growth

While our travel, both regular and party business, has shown a healthy growth, it is, perhaps, a little early to develop statistics which would illustrate a true growth as, in many cases, early competitors have withdrawn from routes which we now operate exclusively and these routes obviously have shown a tremendous growth. To illustrate, in the month of June, 1927, our party business was practically 70 per cent greater than in the same month of 1926. While we feel that part of this growth was due to intensive solicitation and development of this travel, certain of it is, no doubt, due to the withdrawals of individuals who formerly performed this class of service.

SOLICITING your consideration when planning for transportation account of Lodge Visitations, Social Functions, Athletic Contests, Theatre and Club Parties, Picnics, Outings, etc.
DeLuxe type Motor Coaches, driven by competent Operators; furnished at reasonable rates.
Information, Rates and Routes will be supplied at any Company Office, at any Railroad Station or on application to:
New England Transportation Company
H. PRICE, Traffic Manager, South Station, Boston Phone Beach 3800
A. E. STEWART, Superintendent, Railroad Station, Hartford Phone 1-6101
W. M. GUSTIN, Superintendent, Railroad Station, Brockton Phone 3588
F. J. CURRAN, Terminal Supervisor, 6 Fountain St., Providence Phone Union 0996

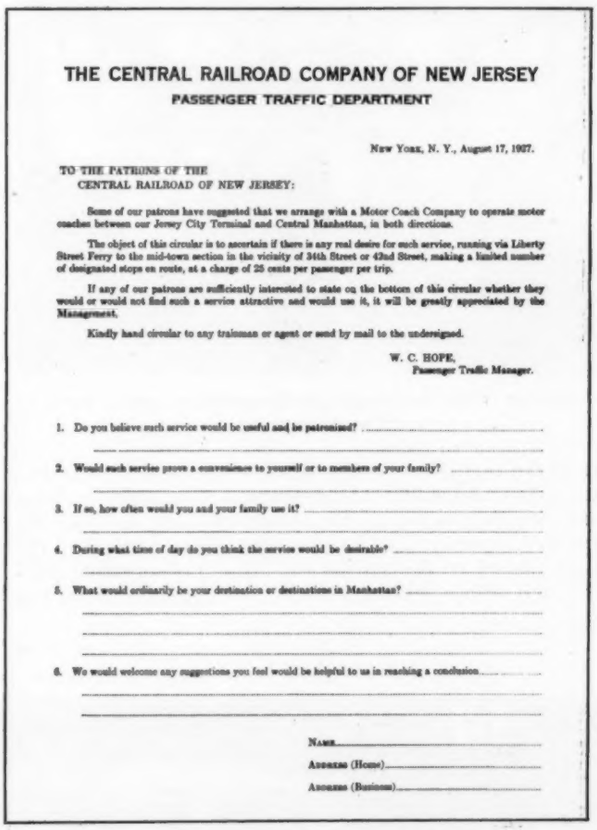
Special Party Solicitation Cards Are Widely Distributed

Centrally Located Stations Important

One feature in connection with traffic development is of paramount importance, viz.: centrally located terminals in the larger cities. The matter of serving the public conveniently is considered vital in the success of any motor coach route and particularly so in connection with competitive services.

C. N. J. Considers Bus Operation in New York

PASSENGERS on Central of New Jersey trains entering New York on August 17 were given questionnaire blanks upon which they were asked to state their opinions regarding the establishment of a bus line to connect the mid-town section of New York with the Jersey Central's metropolitan terminal at Jersey City. One of these blanks is illustrated herewith.



THE CENTRAL RAILROAD COMPANY OF NEW JERSEY
PASSENGER TRAFFIC DEPARTMENT

New York, N. Y., August 17, 1927.

TO THE PATRONS OF THE
CENTRAL RAILROAD OF NEW JERSEY:

Some of our patrons have suggested that we arrange with a Motor Coach Company to operate motor coaches between our Jersey City Terminal and Central Manhattan, in both directions.

The object of this circular is to ascertain if there is any real desire for such service, running via Liberty Street Ferry to the mid-town section in the vicinity of 34th Street or 42nd Street, making a limited number of designated stops en route, at a charge of 25 cents per passenger per trip.

If any of our patrons are sufficiently interested to state on the bottom of this circular whether they would or would not find such a service attractive and would use it, it will be greatly appreciated by the Management.

Kindly hand circular to any trainman or agent or send by mail to the undersigned.

W. C. HOPE,
Passenger Traffic Manager.

1. Do you believe such service would be useful and be patronized? .....
2. Would such service prove a convenience to yourself or to members of your family? .....
3. If so, how often would you and your family use it? .....
4. During what time of day do you think the service would be desirable? .....
5. What would ordinarily be your destination or destinations in Manhattan? .....
6. We would welcome any suggestions you feel would be helpful to us in reaching a conclusion .....

NAME .....
ADDRESS (Home) .....
ADDRESS (Business) .....

The Jersey Central's Questionnaire Form

The company is not committed to the operation of such buses as yet, the seeking of the opinion of passengers as to the utility of such an undertaking being, of course, but one of several questions with relation to its establishment which must be answered before definite plans can be laid.

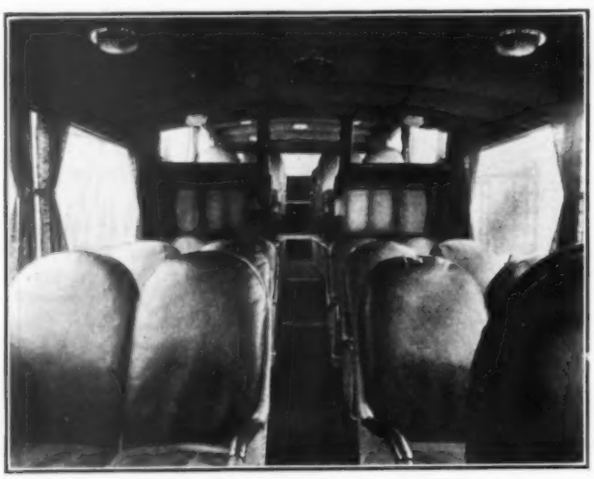
The proposed fare, mentioned in the questionnaire, would be 25 cents which would include transportation by

ferry, on which the buses would have to be conveyed across the Hudson river.

Buses are now being operated from mid-town New York to this terminal for the transportation of Baltimore & Ohio passengers. This road provides the bus service without charge to its passengers. On the other hand, its passenger business into and out of New York is exclusively long-haul, whereas the Jersey Central's business is almost as exclusively short-haul and suburban.

A.C.F. Observation Parlor Coach

IN the ordinary type of coach with all of the passengers seated in one compartment, it is natural for the first people in the coach to select the seats near the operator because of a better view of the countryside through the front window. When the coach is full, it often happens that the passengers going a short distance



Interior View Showing the Observation and Lower Compartments

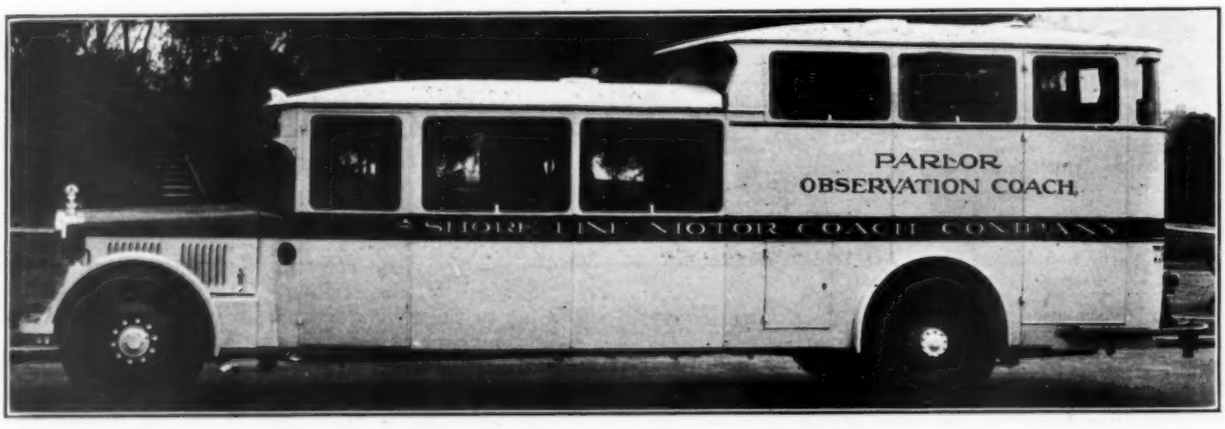
are at the rear of the coach which tends to delay the discharging and loading of passengers. In order to help eliminate this situation the American Car & Foundry Motors Company, 30 Church street, New York, has recently placed on the market the Newell observation parlor coach with a seating capacity for 29 passengers, exclusive of the driver—12 passengers in the lower compartment and 17 in the observation compartment. With this seating arrangement the passengers going a long distance take seats in the observation compartment, while the short-haul passengers will find seats in the compartment nearest the exit. The coach is arranged for one-man operation using the right front door for both entrance and exit.

The Model C4 body is carried on the Model 508-2 chassis that has a wheelbase of 230 in. The body and chassis are built of materials and to the rigid specifications commonly used for the construction of A.C.F. motor coach equipment. The body framing is constructed of white ash reinforced with steel angles and plates which make for a rigid body. The cowl consists of a pressed steel frame, welded and riveted together. A heavy ribbed aluminum casting is bolted in to obtain the proper body curves. All window panels are made of No. 20 gage pressed steel and all other lower panels with No. 16 gage aluminum. The roof is of the "soft" type free from rumbles. The yellow pine floor is covered with 3/16 in. gray cork filled linoleum laid on cement.

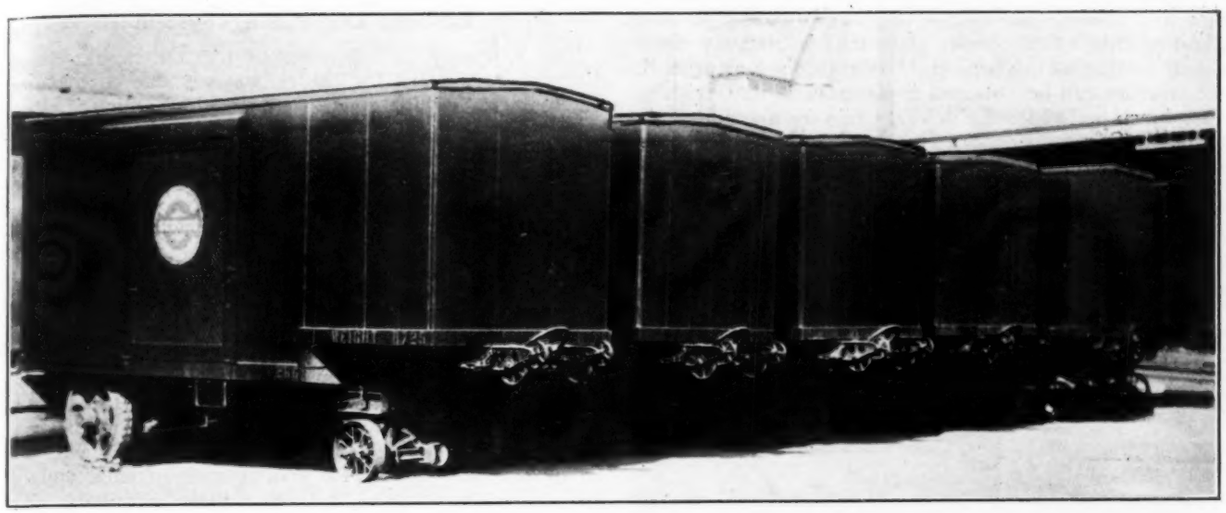
The interior lighting consists of four dome lights in the lower ceiling and six in the observation compartment ceiling. All dome lights are 21 c.p. with frosted diffusing lenses. There is one ventilator in the lower compartment and two in the observation compartment roof. Exhaust from the engine may be diverted for heating purposes by a suitable valve through 1¼ in. seamless steel tubing extending along both sides of the body under the outer seats in both the lower and observation compartments and across the observation compartment under the transverse seat at the rear.

The space under the observation compartment is used for carrying baggage and express matter. This space is clean, dry and easily accessible. The total space is 140 cu. ft. or nearly 5 cu. ft. per passenger. The floor area is 53 sq. ft., or 1.8 sq. ft. per passenger. A double door having a clear opening 28 in. high by 33 in. wide is located on the right side to the rear of the wheel housing. Ahead of the wheel housing on the right and left side is a single door 23 in. high by 19 in. wide.

THE SOUTHERN PACIFIC, which operates a number of electric lines in Eugene, Oregon, has been granted permission by the public service commission of that state to abandon the street railway service and to substitute motor bus service on all routes now served by the electric lines.



The A. C. F. Newell Type, 29-Passenger Observation Coach



Six Trailers Spotted for Loading

Tractors and Trailers Transfer L.c.l. Freight at Oakland

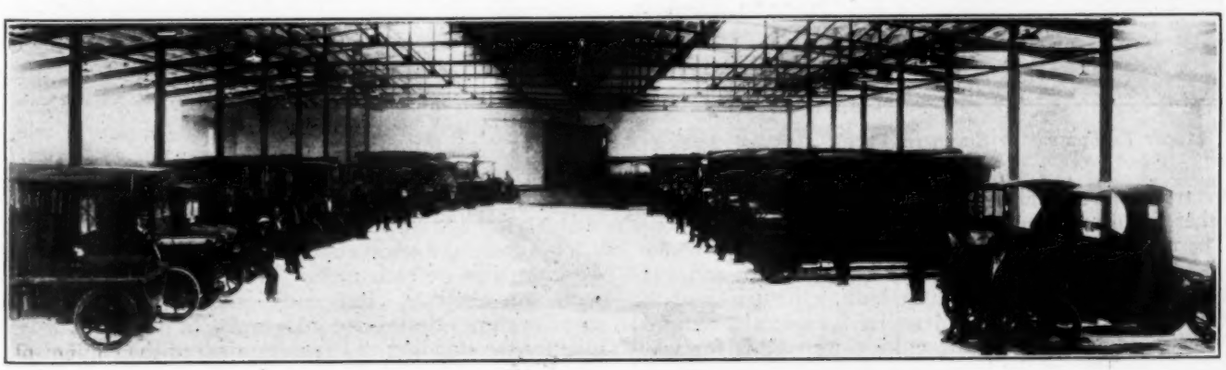
Drayage Service Corporation operates over 100 *units under contracts with S. P., A. T. & S. F., and W. P.*

ALL inbound and outbound l.c.l. freight moving between stations of the Southern Pacific, the Atchison, Topeka & Santa Fe, and the Western Pacific in the East Bay district of Oakland, Cal., is being handled by means of tractors and trailers operated by the Drayage Service Corporation, Oakland, Cal., under contracts with the railways. This company operates one of the largest fleets of commercial vehicles in the west and has developed its facilities, methods of dispatching, office records and other operating details to a high degree.

Among the advantages offered the railways and shippers through the motorized method of transferring l.c.l. freight between stations are the release for line haul of many box-cars, otherwise required in the switching service between local stations, with a corresponding reduction in switching and operating expense, and the shortening of the time required for the merchandise to reach its final destination by from 24 to 48 hours. This saving of time to shippers is possible in Oakland by reason of the fact that, due to city ordinances and other physical handicaps, it has become increasingly difficult to switch cars from outlying terminals to main transfer sheds, through which all inbound and outbound merchandise has to pass. By the use of tractors and trailers, the Drayage Service Corporation is able to pick up a carload of merchandise located, for example, three miles from the main transfer shed and deliver it in 13 minutes from the time that the car is pulled from the suburban receiving station.

Flexibility and Economy Advantages of Tractors and Trailers

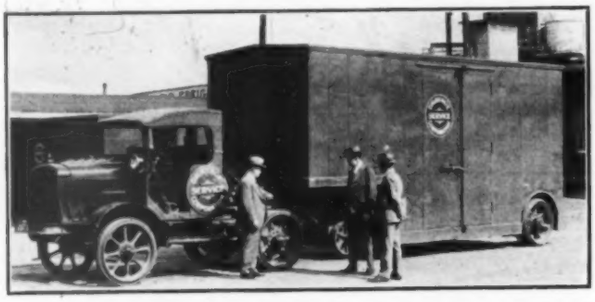
Originally, W. P. Scott, president of the Drayage Service Corporation, intended to use motor trucks for this transfer service but he turned to the tractor and trailer when it developed that in this particular instance truck operation would involve a considerable waste of



Interior of Drayage Service Corporation Station at Oakland

time and power. By the use of tractors and trailers the standing time of the power plant unit is virtually eliminated, so that as much as eight hours of actual work by the tractors can be obtained in a ten-hour day, with an hour lunch period for the driver, while the average of the Drayage Service Corporation operation is better than seven hours of actual tractor work in a nine-hour day.

Keeping the motor unit in continuous operation has brought about great economies in operating cost, since motor idleness is the most flagrant of all haulage wastes. In the records of the company are many instances of a single tractor serving eight semi-trailers continuously



Low-Bed, Drop-Frame Semi-Trailer Originated by Drayage Service Corporation

throughout the day, without any time of actual motor loafing.

In the congested city traffic, the tractor and trailer have proved themselves superior to trucks in point of ease of handling, in the opinion of the heads of all the departments of the Drayage Service Corporation. The tractor, for example, turns in its own length of less than 15 ft., while trucks of similar size require at least 20 ft.

Large Fleet of Trucks, Tractors and Trailers

The Drayage Service Corporation, doing a general transfer work in addition to its work for the railways, operates a large number of tractors and trucks of various makes, including Fageols, Federals and G.M.C.'s. In the railroad service, 100 Lapeer semi-trailers, all with specially designed bodies, are used. The ratio of trailers

Motor Equipment at Southern Pacific Oakland Station

to tractors, depending on distance, return loads and other factors, ranges from two to one to eight to one. The trailers are equipped with miniature box-car bodies. This body is sealed by the railroad station clerk and waybills on shipments are given by him to the driver of the tractor handling the loaded trailer. Seals are removed by a receiving clerk of the railway who signs for waybills. By this method loss and damage claims are reduced to a minimum.

Efficient Dispatching System

The efficiency of operation of the Drayage Service Corporation's work for the railways is due to the dispatching system for tractors and trailers which it uses. The railway division of the company, comprising all equipment used in transfer work for the various railways, is under the supervision of a chief dispatcher. His office is located at the Southern Pacific freight station in Oakland and is connected with all division stations by private telephone lines. The basic principle of the system is that the chief dispatcher knows at every moment the exact location, load and destination of every tractor and trailer in the fleet.

The method by which this is accomplished is simple and easily handled. The first step in establishing the dispatching system was to number all tractors and trailers in the same manner that freight cars are numbered. Second, a dispatcher's sheet was provided, showing all terminals, with spaces for the number of each tractor and trailer moving to and from these terminals. To break up the peaks at the various stations and to develop an even flow of business at the main transfer terminals, the railroad freight stations, a careful check on the operating situation is maintained by the dispatcher at all times. Since he must know whether a trailer is moving heavy or light, the clerk at the point of origin of a load telephones

Loading a Trailer at a Railway Station

to the chief dispatcher the size and character of the load, its destination and the exact time at which it left his hands. The driver of the tractor as soon as he picks up a trailer, either loaded or empty, telephones the same information to the chief dispatcher, who consequently has a double check on the movement, which is recorded on his dispatcher's sheet.

Similarly on the arrival of the trailer at destination, the tractor driver and the clerk employed by the consignee each telephone to the dispatcher the information as to the time of arrival, character of the load, and whether the trailer will be sent back full or empty. As soon as a trailer is loaded, the clerk at the point of origin telephones the chief dispatcher who is then prepared to send the first available tractor for it.

Operation of Tractors Checked

To supply the necessary information as to the exact working time of each motor, every tractor is equipped with an accurate, frequently examined and tested speedometer. Sealed recordographs, which indicate in minutes the standing and running time of the equipment, are also installed on all tractors. By means of a time clock stamp in the dispatcher's office, the time of arrival

and the departure of every vehicle is kept on record.

In a simple box file on the dispatcher's desk is kept a series of cards, white on one side and pink on the other, each representing a trailer. These cards bear notations as to the stations to and from which each trailer is moving. As information on the movement of a trailer comes in, the dispatcher, again using the time clock stamp, prints the time in and out on its card. He can tell at a glance where each trailer is and whether it is inbound or outbound. The card facing one way in the box means that the trailer is inbound; facing the other way indicates that the trailer is outbound.

This home-devised card record of the trailers acts as a check on the dispatcher's sheet. From the two sources, the chief dispatcher knows instantly when a tractor is available and where the loaded or empty trailers to be picked up are waiting. On the basis of this information, he sends out tractors to pick up the trailers, and deliver them wherever they may be consigned, just as switch engines are sent out to pick up freight cars.

In providing this transportation service to the railways, the Drayage Service Corporation is called upon to feed to and deliver from 18 stations or depots in what is known as the "East Bay switching limits." The contract with the railways is one of the largest of its sort ever let to an individual motor carrier in the United States. The success of the drayage company's operations has been due to its ability, through its dispatching system, to effect a maximum of rapidity in transportation and a minimum of waste of equipment, machine performance and manpower.

Six-Wheel Coach for Use in Congested Districts

A SIX-WHEEL type of bus, particularly adapted for operation where fast schedules are maintained in congested districts on the principle of the circulating load, has been built by the Six-Wheel Company, Philadelphia, Pa. It is of the 29-passenger city

The Front and Rear Doors Are Pneumatically Controlled—The Door Valves Are Electrically Operated

service type with a front entrance and rear exit; the front and rear doors are pneumatically controlled. The rear door is treadle operated, opening only when the vehicle is brought to a full stop and brakes are kept applied. The vehicle cannot be started until the rear door is entirely closed which releases the brakes. The door-engine control is noteworthy in that the valves are electrically operated which eliminates a large amount of piping heretofore necessary.

The interior is trimmed in mahogany. The chassis features include air brakes for the service brakes and booster brake for the emergency.

Rail-Bus Service Between Chicago and Detroit

A NEW form of train-motor bus co-ordination was undertaken on July 22, by the Chicago, South Shore & South Bend (electric) and the Shore Line Motor Coach Company, both controlled by the Samuel Insull interests. The new service is in operation between Chicago and Detroit, Mich., one

White Bus and Connecting Electric Train at South Bend

schedule being operated in each direction daily. Between Chicago and South Bend, Ind., high-speed electric trains of the railway are used, connection being made at South Bend with motor buses running between that city and Detroit.

Detroit-bound passengers leave the Randolph street station in Chicago at 11 a. m., arriving on the electric train at South Bend at 1:33 p. m. Transfer is then made to the bus leaving South Bend at 1:35 and arriving at Detroit at 7:30 p. m. The Chicago-bound bus leaves Detroit at 11 a. m., arriving at South Bend at 4:50 p. m. where transfer is made to the electric train leaving South Bend at 5 p. m and arriving at Chicago at 7:30 p. m. The trains in both directions carry dining cars.

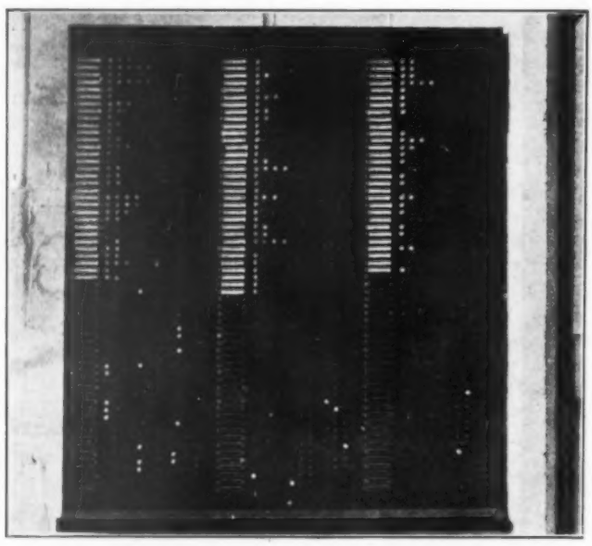
Two White six-cylinder motor buses are used between Detroit and South Bend. Each bus is equipped with toilet and washroom facilities, over-stuffed air cushion seats, an observation compartment and an inside baggage compartment. The buses seat 25 passengers and make a non-stop run between Detroit and South Bend minimizing delay by avoiding large towns. The Chicago-Detroit run is 284 miles, 194 miles by bus and 90 miles by electric train. The 8½ hour service cuts three hours from the present bus running time between the two cities. The fares are $7.50 one way and $14 round trip, with a $5 rate for the bus trip between South Bend and Detroit.

THE FIRST HEARINGS on applications for bus line certificates under the new Texas motor bus law, which went into effect on June 15, were held on August 15 at Dallas, Tex., before the entire Railroad Commission of that state. The hearings covered 107 protests of railways against applications for certificates by bus lines.

Bus Route Board for the Mechanical Department

ONE of the many duties of the mechanical superintendent of the New England Transportation, bus subsidiary of the N. Y., N. H. & H., is to see that all of the routes are covered with properly serviced units and amply protected with reserve units. The schedules cover approximately 175 routes, and it is quite a problem to properly protect them with 206 units of equipment. To simplify the problem, a schedule board has been made which is kept in the mechanical superintendent's office. The board has on it three perpendicular rows of brass card frames, each of which hold a card on which is printed the name of a route. There are 60 card frames in each row, which makes a total of 180 on the board. Twenty small holes are drilled in the board after each card frame. Three different colors of wooden pegs are placed in these holes. Each peg represents a unit of equipment. The white pegs indicate buses on assigned runs, yellow pegs, spare buses and the red pegs equipment in the shop for repairs.

By the proper placing of these pegs a complete picture is obtained as to whether the buses are in regular or spare service or in the shop for repairs.



A Bus Route Board Which Gives to the Mechanical Superintendent a Complete Picture as to the Location of Each Bus

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INDEPENDENT BUS LINES operating between Philadelphia and the seashore at Atlantic City, N. J., a distance of about 60 miles, have reduced their rates to $2 for the round trip, the reason being a rate war between the rival operators. It is stated that one independent operator has already gone into bankruptcy and that a large manufacturer has recalled buses sold on a time payment basis, the recall being based on the fact that the present rates allow but slight profit even when the buses are filled to capacity.

The Philadelphia Rural Transit, a subsidiary of the Philadelphia Street Railway and subsidiary lines, has a round trip rate of $2.75.

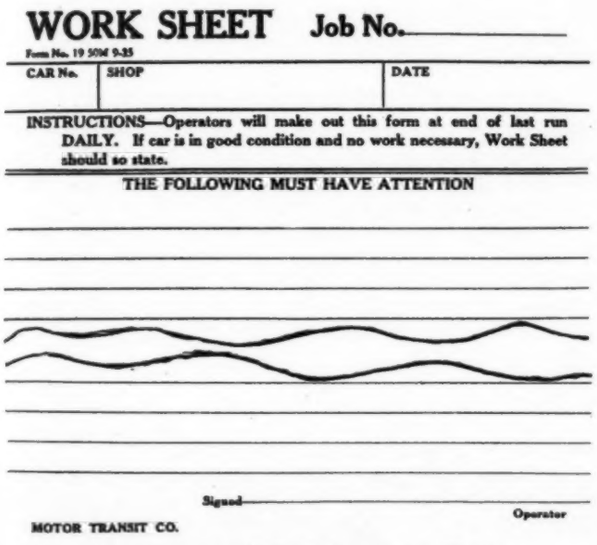
The railroads serving this territory placed reduced rate round trip fares in effect at the beginning of the summer season this year.

Southern Pacific Mack Bus with Duralyte Body

Coast Bus Line Keeps Careful Repair Records

Nature and cost of maintenance work necessary checked closely by Motor Transit Company of Los Angeles, Cal.

A DISTINGUISHING feature of the methods of operation of the Motor Transit Company of Los Angeles, Calif., is the careful way in which it keeps records of the performance of its buses and the accessories with which they are equipped, and the cost of maintenance work necessary on them. The operations of this company, which has 1,400 route miles of suburban stage lines in the vicinity of Los Angeles and carries more than 3,600,000 passengers a year, were described in the *Motor Transport Section* of December 25, 1926.



WORK SHEET Job No._____

Form No. 19 50M 9-25

CAR No. | SHOP | DATE

INSTRUCTIONS—Operators will make out this form at end of last run DAILY. If car is in good condition and no work necessary, Work Sheet should so state.

THE FOLLOWING MUST HAVE ATTENTION

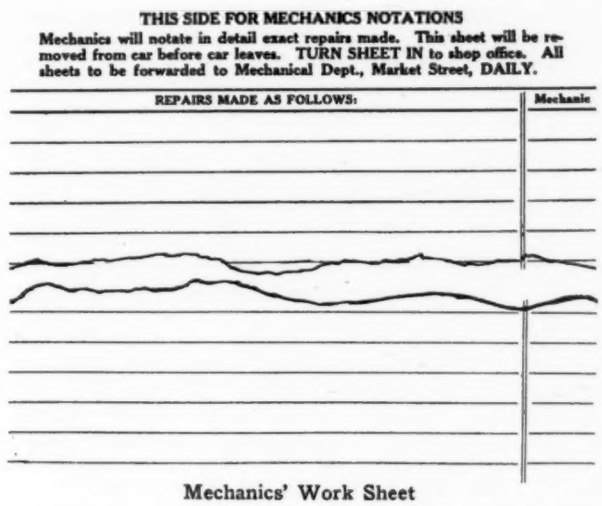
Signed_____ Operator

MOTOR TRANSIT CO.

Bus Operators' Work Instruction Sheet

The Motor Transit Company designs and maintains all of the equipment that it owns and follows a definite policy of rebuilding its cars as required. Since the bus line is reasonably compact, only one general repair shop is required. This is located at the general headquarters of the company on Market street in Los Angeles.

Facilities for making light repairs are available, however, at all the stations of the company where buses lay over for the night. At such points minor repairs and adjustments are made by inspectors located at these stations. At Riverside, 66 miles from Los Angeles, maintenance facilities of somewhat greater magnitude are located, and at San Bernardino, from which point the mountain buses operate, all but the heaviest repairs can be made. The general policy of the company, however, is to take buses requiring repairs to the shop on Market street, Los Angeles, where equipment and me-

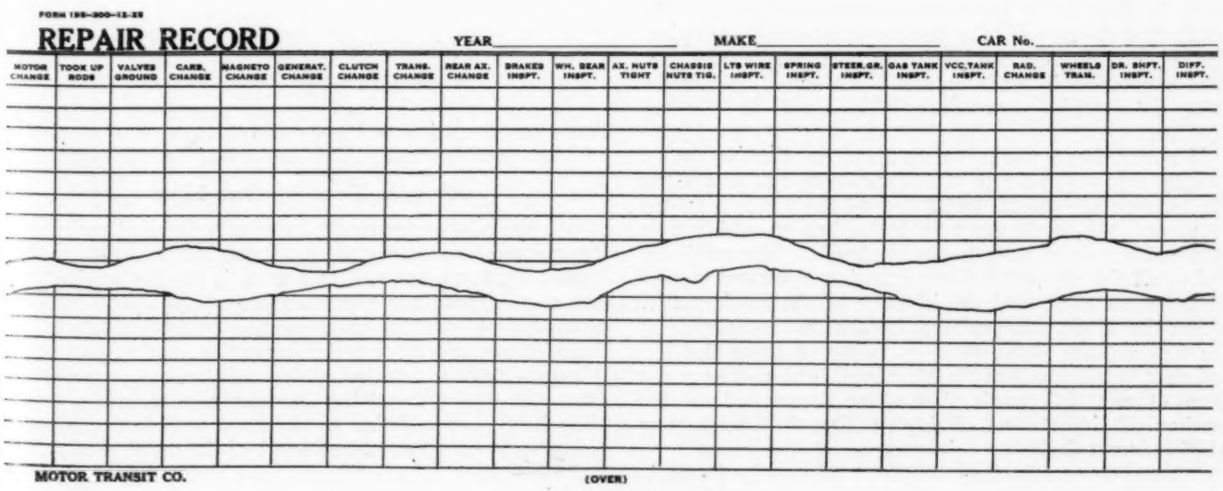


THIS SIDE FOR MECHANICS NOTATIONS

Mechanics will notate in detail exact repairs made. This sheet will be removed from car before car leaves. TURN SHEET IN to shop office. All sheets to be forwarded to Mechanical Dept., Market Street, DAILY.

REPAIRS MADE AS FOLLOWS: | Mechanic

Mechanics' Work Sheet



FORM 198-200-12-25

REPAIR RECORD YEAR_____ MAKE_____ CAR No._____

MOTOR CHANGE | TOOK UP RODS | VALVES GROUND | CARB. CHANGE | MAGNETO CHANGE | GENERAT. CHANGE | CLUTCH CHANGE | TRANS. CHANGE | REAR AX. CHANGE | BRAKES INSPT. | WH. BEAR INSPT. | AX. NUTS TIGHT | CHASSIS NUTS TIG. | LTG WIRE INSPT. | SPRING INSPT. | STEER. GR. INSPT. | GAS TANK INSPT. | VCC. TANK INSPT. | RAD. CHANGE | WHEELS TRAN. | DR. SHFT. INSPT. | DIFF. INSPT.

MOTOR TRANSIT CO. (OVER)

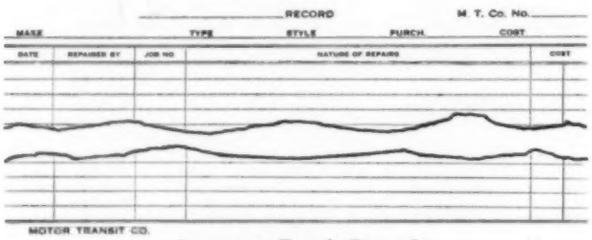
Bus Repair Record Card

chanics are available for the making of any sort of repairs and for the rebuilding of buses.

Careful Inspection the Basis of Maintenance

The Motor Transit Company is a firm believer in the policy of preventive maintenance rather than repair after failure as a means of keeping maintenance costs at a minimum and the buses in service. Consequently, thorough inspection of all cars in service is made daily by inspectors located at all points where buses tie up each day for any length of time. Among other things these inspectors must certify that brakes, transmissions, steering gear and axles are in first-class condition and safe for service and that all axle nuts are tight. The wheel alignment, particularly the track of the rear wheels, is watched closely.

A daily inspection report for each bus is made out by these inspectors. This report bears the number of the bus, and the date. Sixteen items are listed below, showing the parts inspected and whether they are in good condition. These items are: (1) motor; (2) radiator; (3) transmission; (4) differential; (5) front axle; (6) steering gear; (7) battery; (8) magneto; (9) generator; (10) carburetor; (11) oil pump; (12) water pump; (13) shock absorbers (left); (14) shock absorbers (right); (15) starting motor; (16) booster brake.



Accessory Repair Record

Work Sheet the Basis of Repair

The work sheets turned in by bus operators at the ends of their last runs daily, together with the inspection records, of course, are the basis of all repair work done on the buses and their accessories. In the event that trouble develops on a bus during the day before the completion of its schedules, which renders its continued operation unwise or unsafe, it is turned in by the operator with the work sheet, showing the nature of the defects, and he continues his schedules with a bus drawn from the reserve rolling stock. One side of the work sheet is filled in by the operator, who notes on it the number of the bus and the parts which require attention. If the car is in good condition and no work is necessary, such a notation is made on the work sheet. After the filling in of this work sheet, it is signed by the bus operator.

If maintenance work is necessary, the shop inspector assigns a job number to the work sheet and fills in, in the appropriate spaces, the date and the location of the shop, and the work sheet with the bus to which it is attached is turned over to the mechanic. The mechanic makes all the repairs indicated, noting the exact nature of the work done and the identity of the mechanic by whom the work was performed. On the completion of the repairs, the work sheet is removed from the bus before it is taken out of the shop, and is turned in at the shop office. All work sheets are forwarded to the mechanical department of Motor Transit Company at Market street daily.

A careful record of all repairs made to its buses is kept by the Motor Transit Company. A special cardboard record sheet, 8 in. by 12 in., is kept for each bus at the mechanical department headquarters. Each sheet has designated spaces for the notation of the year, the make of the bus and the number assigned to it by the company. It contains columns for 22 headings, each representing a different kind of repair. Under the respective headings, the dates of repairs of such natures are noted.

These 22 kinds of repairs are: Motor change, take-up rods, valves ground, carburetor changed, magneto changed, generator changed, clutch changed, transmission changed, rear axle changed, brakes inspected, wheel bearings inspected, axle nuts tightened, chassis tightened, lighting wires inspected, springs inspected, steering gear inspected, gasoline tank inspected, vacuum tank inspected, radiator changed, wheel tram inspected, drive shaft inspected, and differential inspected.

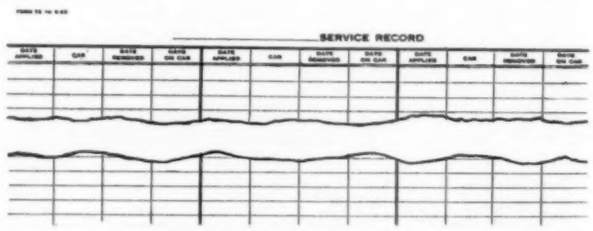
Cost records of all repairs are kept for each bus and these are reduced to a mileage basis, so that comparisons can be made monthly and annually. These enable the company to keep a constant record of what its various buses are costing it for maintenance, and enable accurate judgment as to the need for replacement of buses or their rebuilding.

Records Kept of Accessory Performance

The Motor Transit Company maintains records of all accessories used on its buses. When accessories are purchased, they are assigned serial numbers and the make, type, style, date of purchase and cost are noted on the record card of each individual accessory. This card is 8 in. by 5 in. in dimensions. From the time that the accessory is installed on a bus until it is worn out or discarded for any other reason, a complete record is maintained of the date, cost and nature of any repairs that are made to it.

The front of the accessory card has spaces in which can be noted the date repairs are made, the identity of the mechanics making the repairs, the job number, the nature of the repairs made and their cost.

The back of the card shows the accessory's service record and has spaces for the notation of the dates on which it is applied to a bus, the number of the bus, the dates on which the accessory is removed from the bus, and the number of days it is in service on each car.



Accessory Service Record Form

Records Kept by One Man

In spite of the apparently extremely detailed nature of the records of maintenance of its buses kept by the Motor Transit Company, this work is readily handled by one man. Data for the complete records kept at the headquarters of the maintenance department in Los Angeles are taken from the inspection and work sheets when they are forwarded to the maintenance department from the various outlying garages and from the main shop itself. In addition to the records indicated above, this man keeps a complete record of the number of miles run per gallon of gasoline and per quart of lubricating oil for each bus.

Operating the Motor Bus Safely*

Problem one of education, not only of bus drivers but entire public—Importance of railroad training

By Frank S. Hobbs
Manager, New England Transportation Company

WITH a program for the coming year which contemplates the operation by the New England Transportation Company of 215 motor coaches and other vehicles making 6,000,000 coach miles over 1,100 miles of highway and probably carrying four millions of people, the subject of safe motor bus operation is one in which I am naturally deeply interested. While perhaps our experience in motor coach operation is the equal of any, yet I confess to approaching the discussion of safe highway operation with some hesitancy.

Look to Steam and Electric Lines for Standards

To analyze the problem presented by the topic our thinking must hinge upon the complete meaning of the word safety, and when I say "complete meaning" the term is used to include all the elements that enter into the business of a common carrier. Safety, therefore, viewed in the light of a common carrier's duty is more than ordinarily comprehensive. Certain safety standards have been built up by the so-called established carriers. By those I mean the steam railroads and the street railways. To them, therefore, it seems safe to look for standards. Safety to them means not alone the avoidance of injury to the carrier's property, its employees and its patrons, but to all others of the public. The problem, of course, is not the same as that where highway operation is concerned because in the case of the railroad the operation is almost entirely on a private right-of-way and the operation is confined to a track, so that the limitations of operating activity are fixed. Even so, however, a deal of education is necessary to bring a proper appreciation of what constitutes a safe condition. When we get on to the highway, whether it be with the privately owned automobile, the motor truck or the motor coach, only the personal element as represented in the operator remains common to the safety situation as applied to moving vehicles. There is no other limitation to highway operation's scope than the length and breadth of the roadway, and yet the problem of public safety is quite as pressing and may well be considered as even more acute than is the case with the carriers who operate on a fixed course. It seems to me, therefore, that the hope for safe operation on the highway lies in education and an appreciation of personal responsibility, just as it does in the case of the operator of railroad or railway equipment.

The Railway Cannot Pursue Its Victim

Let us for a moment compare the hazards of old line operation with those of highway operation. This much can be said about railroad and railway movement—neither a railroad train nor a trolley car can pursue the individual who is made the victim of some unfortunate occurrence in which either of the old line carriers is involved. One of the reasons why the old line carriers see much of their business leaving them is because of their lack of flexibility. However unfortunate it may be to make this statement, if one is to get into trouble with a steam train or a trolley car it is undeniably necessary for that person to go where the steam train or the trolley car is. The hazard of old line operation, therefore, is more particularly affected by the condition of equipment and the location of physical factors introduced into operation. On the other hand the very success of the highway vehicle is founded upon its flexibility to go wherever there is a road, and some so-called vehicles even venture farther afield. Such being the case, every other highway vehicle becomes a hazard to every operator, and every piece of road and every street corner is a potential menace. But to revert to our original proposition, safety in this operation resolves itself into an intelligent understanding of the operator's obligation to the public, except that in this instance that obligation is multiplied by as many hundred thousand times as there are additional opportunities for unfortunate consequences. All of this is said merely to emphasize the undeniable fact that the fundamentals of safety are in no way altered by the introduction of the continually increasing element of highway congestion.

Study the Vehicle and Select Operator with Care

What then shall we do as operators of the new type of common carrier vehicle, the motor coach, to discharge our obligation to maintain a continually improving standard of safety? In this I do not attempt to dictate. I am glad, however, to draw from our experience as the largest individual motor coach operator in interstate service in the country. In putting motor coaches on the highway we have had constantly in mind two things which affect the safety of highway users—first, the peculiarities of the vehicle itself and, second, the character and training of the operators. The motor coach is big; it is powerful; it has almost unlimited possibilities for speed, and when loaded it carries from 25 to 40 precious human lives. Obviously then its construction must be substantial and its equipment, with especial reference to its control, as near to perfect as human ingenuity and effort can maintain it. On the operator's end the man who drives this new type of passenger carrying vehicle must be chosen with great care. Primarily he must be temperamentally fitted for his work. If possible, he should have had experience. In any event he should be given training before being allowed alone on the road with his new responsibility. He should be governed by definite rules and should be educated to an understanding of what those rules mean, and then should be held to an observance of those rules by an intelligent system of discipline intelligently administered. Those are the considerations, as I have said, which we had in mind and have attempted to put into practice during the two years of our existence. They have worked out this way. Our total coach mileage operated is 6,039,778.

From the beginning of our operation on August 10, 1925, we have operated 45,756 coach miles for each per-

*Abstract of an address delivered before the Sixth Annual State Conference on Industrial and Highway Safety at Worcester, Mass., on May 18, 1927.

sonal injury that has arisen, and none of these, I am thankful to say, has been serious because in this statement is included every sort of claim, however trivial, which we have had to adjust. To date we have had no fatal accident, and while it is improbable that any great organization can be indefinitely spared the misfortune, yet our constant effort is and will continue to be directed toward such a sane operation as will keep our record clear in that regard. I take some pride in the record which I have just given, and if you will permit me I would like to detail to some of the methods we adopted by which to accomplish this end.

Importance of Railroad Training for Bus Drivers

First, so far as is possible, we select our employees from former employees of the railroad because these men have had instilled into them during their railroad experience an appreciation of what safety means. Second, before any operator is allowed on the road in charge of a coach he is given a physical examination (color, sight and hearing) and a period of training, the length of which depends somewhat upon his own personal equation. Third, we have prepared a complete set of rules governing the handling of motor coach operation. With those rules each operator must be familiar, even as is the active railroad man familiar with the rules governing his work. In those rules the penalty for infringement is clearly set forth, and that penalty is inevitably applied to any infraction. In other words, the rules are real and the operators understand that they mean exactly what they say. For example, we have framed our schedules at 20 m.p.h. and limited the speed of our motor coaches to 30 m.p.h., and while under certain conditions a leeway of a mile or two in favor of the operator might be allowed, if the maximum mileage recording hand on the speedometer shows 35 miles or over, that is cause for immediate dismissal of the operator, regardless of the circumstances under which the speed was made.

Large Transportation Company Already Has Experience

While there may have been some sentiment before, while unfounded in fact, against highway operation by a large transportation organization, yet I think I am justified in saying the responsibility and appreciation of what common carrier operation means by the large organization have, in New England at least, practically overcome any such sentiment as might have been in existence a few years ago. I do not propose here or at any time to criticize the small highway operator. He is getting his experience as he goes along, and it is only natural that such experience should prove expensive. I do want to say, however, that the sooner he and the public come to a realizing sense of just how great his responsibilities for safe operation are, then much progress will have been made toward the reduction of accidents.

Dangerous Practices by Others

I presume everybody feels that his particular problems are complicated by outside influences and by actions of people over whom he has no control. Certainly this is true of those of us who are in the business of highway transportation. We feel distinctly that the same kind of education that we give to our own operators and to which we are continually endeavoring to add, could well be devoted to the drivers of other vehicles on the highway and to the pedestrian, who seems to be a factor almost beyond control. I have taken the liberty of culling from our experience certain constantly recurring things done by other people which in spite of all our care, of all our rules, of all our instructions and of all our discipline work against our efforts for safe operation.

Parking by the side of the road is coming to be a more and more increasingly dangerous menace.

Cutting in and of line is a habit that education should be directed against to correct. Of course there are places where it is the proper thing to do, but there are many other cases where it is not only improper but actually dangerous.

The man who wants his half of the road but wants it in the middle should be forced to keep to the right.

Dazzling head-lights, which every public spirited owner ought to be willing to correct on his own account, continue to be a serious handicap to safe night operation.

Left hand turns and passing to the right of a vehicle are increasing menaces which should be more carefully controlled, and the slow driver or the driver who centers more thought on the scenery or the young lady by his side should be refused the privilege of main highways.

With pedestrians and children the problem is constant and tremendous. I believe our operators have been educated to the point where they consider the safety of the pedestrian as their first obligation. For the complications of the problem introduced by absent-minded pedestrians and impulsive children, I can only urge greater activity along educational lines on the part of this great movement—the Massachusetts Safety Council, and a continuing care by every man who operates any type of motor vehicle.

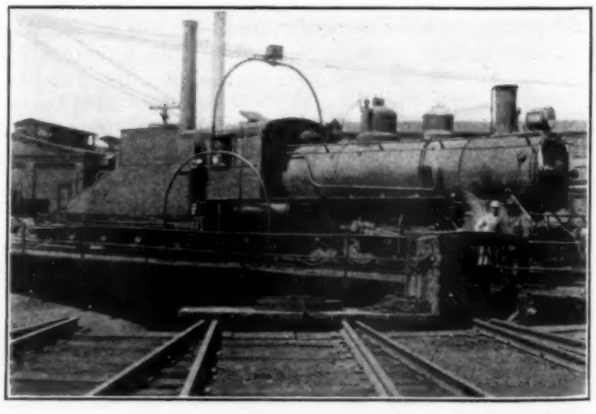
Night driving is complicated by unsatisfactory tail lights on heavy trucks; either they do not exist at all, or they are obscure, obviously owing to their location.

The individual, whether by night or by day, who insists upon the right of way is a menace not alone to himself but to every one else, particularly when entering upon or crossing a main highway.

Do not think that these complaints are made with any effort to shift responsibility for anything that may happen to any coaches under my jurisdiction. If, however, we are willing to exercise such care as will make it possible to reduce accidents to a minimum, we do feel justified in suggesting that the same degree of care be exercised by others who use the highway, in order that the work that we are trying to do may not be nullified by the lack of effort on the part of others.

Importance of Persistent Effort

So in conclusion let me say that our experience tells us the matter of safe operation of motor coaches on the highway is no different from the safe operation of any vehicle anywhere. It is bound up in intelligence founded upon education and sealed with equally intelligent supervision. It presents no problem that is particularly new and certainly presents no problem that cannot be satisfactorily solved by persistent, careful and permanently maintained effort.



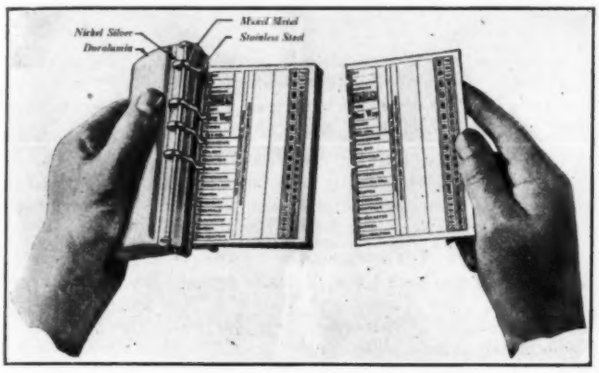
A New Use for a Motor Truck

Recently the electric motor of a busy Long Island turntable failed and, rather than assigning a large force of men to handle it by hand, an Autocar truck of short wheel-base was lowered into the pit and successfully operated the table for a period of 2½ weeks while the electric motor was being repaired.

The Macdonald Cash Receipt Holder

THE illustration shows the method of using the cash receipt holder manufactured by the Macdonald Manufacturing Company, 5015 Wellesley avenue, Cleveland, O. The device can be attached to 1¼-in. tubing so that the operator can issue receipts with one hand, leaving the other free for steering the car, or it can be quickly detached so that fares can be collected after the passengers are seated.

The automatic disposition of the audit stub is accomplished by a simple inward movement of the pad



The Macdonald Cash Receipt Holder

that throws the last audit stub into the holder and out of the way of the succeeding ticket. The movable pointers will, remain set where a large crowd is going from one station to the other.

The device is made of duralumin, German silver and stainless steel and with ordinary care will last a lifetime. The device is made in four sizes, 5, 6, 7, and 8 in. in length.

THE OPERATING CERTIFICATES of 12 motor bus lines operating between Dallas, Tex., and Fort Worth, have been purchased by a Fort Worth banker and associates for a consideration of $96,000. The public utility and management company, Stone & Webster, operators of the Dallas-Fort Worth electric line and of the West Texas Coaches, Inc., is interested in the new company. The new company plans to construct terminals at Dallas and Fort Worth and on September 1, will begin bus service between these points.

Two-Car Gas-Electric Train on B. & M. Near Lynn, Mass.

Motor Transport News

THE PUBLIC UTILITIES COMMISSION of Rhode Island has authorized the New England Transportation Company, and also a competitor, to operate buses between Providence and Westerly (44 miles), with certain restrictions as to the carrying of local passengers. The route from Providence to Westerly is also served by the New York, New Haven & Hartford of which the New England Transportation Company is a subsidiary.

British Railways to Seek Authority to Operate on the Highways

It is reported that a bill will soon be introduced in the British Parliament which would extend the charter limitations of the British railways in a manner to permit them to engage in highway motor transport. The railways now operate horse-drawn and motor vehicles in store door collection and delivery and in a few specific cases already have the right to operate motor vehicles. However, the proposal now brought forward would remove all disabilities from engaging in highway transportation, presumably with safeguards against competition with established highway carriers.

Railroads Oppose Cross-Missouri Bus Lines

Railroads operating across the state of Missouri are carrying on a vigorous fight before the Public Service Commission of that state against the granting of certificates permitting the operation of bus lines by independent companies between St. Louis, Mo., and Kansas City. One proposed line, that of the Capitol Stage Lines Company, would operate between St. Louis and Kansas City via Jefferson City. The railways contend that the thirteen daily passenger trains operated by the Chicago & Alton, the Missouri Pacific, the Wabash and the Rock Island, between St. Louis and Kansas City render the operation of motor buses between these points unnecessary.

C. & A. Seeks Bus Permit in Missouri

The Chicago & Alton has applied to the Missouri Public Service Commission for a permit to operate a motor bus line parallel to its branch line from Mexico, Mo., to Jefferson City, a distance of 50 miles. The proposed bus service would supplement the existing railway service rather than replace it, this being the plan that the Alton has followed in the operation of its bus lines in Illinois. Later the Alton proposes to extend the Mexico-Jefferson City bus line to a connection with its Illinois bus lines at Roodhouse. This proposed 90 miles extension would cross the Mississippi river, at the new trans-Mississippi river bridge now under construction at Louisiana, Mo.

B. & O. Contractor Acquires Terminal

The Fifth Avenue Coach Company, which operates urban buses in New York City and is the operator of the Baltimore & Ohio train connection buses in New York, has purchased a bus terminal tract known as "Astor Court." This tract is in reality a private street next to the Waldorf Astoria hotel. It has been used in the past by taxicabs and by the Baltimore & Ohio train connection buses.

It is stated that the Fifth Avenue Company made the purchase to provide a terminal for the Gray Line Tours, a subsidiary company. Under a police department order all motor buses operating into New York City from outlying points are required to provide their own terminals, and several such are now in the process of construction.

Pennsylvania Commission Approves Reading Charter

The Pennsylvania Public Service Commission has approved the application of the Reading Transportation Company for a corporate charter authorizing the operation of motor vehicles in the state of Pennsylvania. The application for charter is now in the hands of the governor and must receive his approval

before finally granted. The Transportation Company is the highway subsidiary of the Reading Railway. Early in 1926 the company applied for a charter and the application was duly approved by the Public Service Commission but was denied by Gifford Pinchot who was then governor of the state.

Coincident with the application for a charter the company applied for permission to operate a large number of bus lines. None of these applications has yet been acted upon by the Public Service Commission. E. D. Osterhout, passenger traffic manager of the railway, is operating two small bus lines in behalf of the company until such time as the charter is granted. These lines were acquired by purchase.

Government Study of Motor Truck Traffic

In order to determine what proportion of the total tonnage of commodities moving between cities is hauled by motor truck on the highway, and also to develop the factors influencing the choice of motor truck or railroad, an analysis has been made by the Bureau of Public Roads, Department of Agriculture, of the net tonnage hauled between Columbus and 34 other Ohio cities by motor truck and rail lines.

The cities selected are located from seven to 134 highway miles from Columbus and were chosen to permit an analysis of the effect of length of haul upon the proportions transported by motor truck and railroad respectively. Hillsboro and Johnstown, both having indirect rail connections with Columbus, were selected to determine the effect of indirect rail connections upon motor-truck transportation. Commercial Point, Dublin, Reynoldsburg, and Rome were selected to ascertain the amount of tonnage hauled by truck to and from points having no railroad station.

Motor truck net tonnage and railroad carload and l.c.l. tonnage data for an average month of 1925 were taken as the basis for the comparison.

"It is apparent," the Bureau's report says, "that distance is an important factor in the amount of tonnage hauled by motor truck. Between Columbus and Akron, Cincinnati and Toledo, distances of over 100 miles, a very small part of the total tonnage is hauled by truck, while between Columbus and Grove City and between Columbus and Alton, distances of eight and nine miles, respectively, almost all of the freight is transported by motor truck.

"For hauls of less than 20 miles, 84.5 per cent of the tonnage is transported by motor truck; between 20 and 39 miles, motor truck tonnage is 54.7 per cent; and for the longer hauls, it is 32, 24.2, and 2.3 per cent respectively. No appreciable amount of l.c.l. tonnage is found to be carried by rail for distances under 40 miles.

B. & M. Using Trucks to Consolidate L. C. L. Freight

The Boston & Maine has reorganized and expedited its small lot freight service in Boston territory by using motor trucks to carry merchandise between outlying stations and its newly equipped Boston freight terminals at the Northern Artery. The object of the change, it is stated, is to give a better service and thus to regain for the railroad business which has been lost to private and public motor trucks. The change gives small lot shippers and consignees 24 to 72 hours faster service on merchandise bound to or from points in New England, in the West and South. In some instances, the new arrangement involves a saving of present trucking costs to the shipper or consignee.

The regularly scheduled motor truck service operates between the terminal at Northern Artery and the suburban municipalities of Woburn, Waltham, Everett, Chelsea, Cambridge, Stoneham, Watertown, North Somerville, Malden and Winchester, with direct tie-ins with through freight cars to and from important distributing centers. Within a few weeks the plan will be extended to Melrose, Reading and Wakefield, and eventually to other cities in the Greater Boston area and elsewhere in New England.

The new arrangement effects a substantial improvement over previous conditions under which such shipments were either forwarded to transfer points like Salem and Nashua before being put into through cars to destination, or were lost to the railroad because of the delays involved.

The rearrangement of service, it is felt, should effect a reduction in street congestion, by consolidating in a few trucks under regular schedules the scattered merchandise shipments which now move separately in privately-owned trucks and others. The trucking will be performed by present trucking concerns under contract with the Boston & Maine Transportation Company.

The railroad has undertaken a thoroughgoing study of its freight service with a view to greater speed and economy in handling. The study will include the possibilities of further use of motor trucks in its handling.

Orders for Equipment

THE SPOKANE, PORTLAND & SEATTLE has accepted delivery of three Model 53 White buses, bringing its fleet of Whites up to 33.

THE LEAVENWORTH TRANSPORTATION COMPANY which is operated by the Kansas City, Leavenworth & Western, has accepted delivery on six Mack, city type buses of 25 passengers capacity.

THE SYRACUSE RAILWAY CO-ORDINATED BUS LINES, Syracuse, New York, the bus operating subsidiary of the New York State Railways and the New York Central, has accepted deliveries on four 230-inch wheel base Mack buses.

THE SOUTHERN PACIFIC TRANSPORTATION COMPANY has ordered two 23-passenger city type buses and one 21-passenger parlor coach from the American Car & Foundry Motors Company for use between Portland, Ore., and Eugene.

THE COUNTY TRANSPORTATION COMPANY, the bus operating subsidiary of the New York, Westchester and Boston and of the New York, New Haven and Hartford, has accepted delivery on seven Mack, 29 passenger, city type buses for operation in Westchester County, New York.

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY, the bus operating subsidiary of the Southern Pacific, has accepted delivery on two Mack buses of 230-inch wheel base and with four-cylinder engines. The bodies are of the Duralyte "aisle suburban" type, manufactured by the General Aluminum Products Co.

Among the Manufacturers

John R. Hayward has been appointed southern railway sales manager of the **Haywood-Wakefield Company,** with headquarters at Roanoke, Va., succeeding **Frank N. Grigg.**

A. H. Ferrandou, manager of motor coach sales of **Graham Brothers,** Detroit, Mich., has been appointed director of the motor coach division.

Percy Owen, formerly of the automotive division of the Department of Commerce, has been elected president of the **American Brake Materials Corporation,** Detroit, Mich.

A. G. Partridge, formerly vice-president in charge of sales of the Firestone Tire & Rubber Company, has been appointed manager of the western division of the **Goodyear Tire & Rubber Company,** Akron, Ohio.

The **Relay Motors Corporation,** Wabash, Ind., has acacquired the **Garford Truck Company,** Lima, Ohio. The Relay Motors Corporation recently absorbed the Commerce Truck Company, Ypsilanti, Mich., and the Service Motors, Inc., Wabash, Ind.

F. M. Young, vice-president and general manager of the **Racine Radiator Company,** Racine, Wis., has organized the **Young Radiator Company,** of the same city, and has been elected president. The new company will manufacture heavy duty radiators for buses, trucks, tractors and other power units.

The **Twin Coach Company,** Kent, Ohio, has announced the election of the following officers: **F. R. Fageol,** president and general manager; **W. B. Fageol** vice-president in charge of engineering and production; **Paul Brehm,** secretary and assistant general manager; **J. A. Smith,** vice-president and in charge of the eastern territory, New York; and **E. W. Bradley,** vice-president in charge of the central western territory, Chicago. The Smith-Fageol Company, with offices at Los Angeles, Cal., Seattle, Wash., and Portland, Ore., has been appointed representative of the Twin Coach Company on the Pacific coast.